LACUS FORUM XXV

Claremont

GRADUATE UNIVERSITY

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LACUS
FORUM
XXV

LACUS FORUM XXV

Edited by
Shin Ja J. Hwang &
Arle R. Lommel

The Linguistic Association of Canada and the United States

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FIRST EDITION

Published in Fullerton, California, by LACUS, the Linguistic Association of Canada and the United States, c/o LACUS Secretary Treasurer Angela Della Volpe, PO Box 6850, Rm MH103, Fullerton, California 92846-6850 USA.

Manufactured in the United States.

ISSN 0195-377X

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PREFACE

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The Twenty-Fifth Forum of the Linguistic Association of Canada and the United States was held from July 28 to August 1, 1998, at the Claremont Graduate University, on the beautiful campus cluster of Claremont colleges in California.

From over seventy papers presented at the forum, this volume includes forty. One section of especially notable papers appears first. It contains two presidential addresses, one by the 1998 LACUS President Bill Sullivan and the other by the 1997 President David Lockwood, who was unable to be present in the Twenty-Fourth Forum in Toronto. It also features the invited lecturer Ronald Langacker's paper 'Virtual reality', although it does not contain the inaugural lecturer Elizabeth Bates' paper, 'On the inseparability of grammar and the lexicon'. Also included in this special group are the two papers by younger scholars who won the LACUS Presidents' prizes. Sarah Taub was awarded the post-doctoral prize for young scholars, with her presentation of the paper on the American Sign Language which was richly accompanied by her body motions and hand signs reflecting semantic motivations for path directions in ASL. Colin Harrison was awarded the pre-doctoral prize with his paper in the tradition of neurocognitive linguistics. The papers by two others, Iraide Ibarretxe-Antuñano and Frankie Patman, who won the pre-doctoral commendation awards, are included elsewhere in this volume.

The remaining thirty-three papers were selected through review processes by the members of the editorial board and other invited reviewers. The authors of the selected papers were then given a chance to revise their papers in light of the reviewers' comments. This selection process helps to control the size of the volume and to have a collection of high quality papers. *LACUS forum* is no longer a simple proceedings of a conference, but a reviewed volume, similar to journals.

Following the many years of tradition of having a wide range of topics, the forum and hence this volume reflects a rich variety of topics not only in phonology, syntax, and semantics, but also in discourse and pragmatics, neurolinguistics, and cognitive linguistics. In addition, as in the past years, the volume contains papers exploring historical developments of individual languages. Such studies are especially important in our understanding of contemporary languages, as in grammaticalization. Finally, three papers are grouped together loosely in the category of applied linguistics and language contact. The languages studied span the globe. While more papers deal with English than any other language, there are studies of other languages such as Armenian, Finnish, Hebrew, Japanese, Korean, Latin, Nugunu, Polish, Spanish, and Tiriyo.

This volume is produced in a uniform format to enhance the readability for the reader, and a webpage was set up for all the authors to proofread their own papers. The credit for this part of the editorial work entirely resides with the second editor Arle Lommel. His expertise on computing and editing was especially crucial for LACUS *forum XXV* as it was prepared without a series editor.

We would especially like to dedicate our work on the present volume to the memory of Carleton Hodge, who passed away shortly after the Twenty-Fifth Forum. Carleton's good humor, open manner, and willingness to discuss almost any subject were representative of the spirit of LACUS and will be missed.

We thank John Regan, the local chair of the 1998 forum at the Claremont Graduate University, and Ruth Brend, the chair of the conference committee, as well as many others who willingly helped in numerous tasks to make the conference a success. We would like to thank all the members of the editorial board and other invited reviewers who helped us in a timely fashion in selecting papers and recommending guidelines for revisions. Our gratitude is ultimately due to the individual authors whose contributions will determine the quality of the volume. We appreciate their cooperation in several stages during the past year.

◆

I. SPECIAL LECTURES

1998 PRESIDENTIAL ADDRESS

ENGLISH AND HUMAN MORPHOLOGY: ‘NATURALNESS’ IN COUNTING AND MEASURING

William J. Sullivan
University of Florida

> ‘Why don’t you get in step?’ said my Polish-born Israeli friend. ‘The metric system is decimal all the way—decimal is *the natural* way to count (my emphasis, WJS), so metric is the natural way to measure.’[1]

The metric system was designed to be a pure decimal system with convenient weight-volume-liquid measure equivalents. That is, one gram of water is one cubic centimeter of water is one milliliter of water, and one calorie of energy will raise one gram (or cc or ml) of water one degree Centigrade (now Celsius). The apparent advantages of the metric system are even more obvious when we consider the disadvantages of the foot-pound-second system. The foot is divided by twelve rather than by ten, and as the system was built up by accretion, convenient correspondences between weight and volume are rare. For example, there are 0.0362 ounces of water per cubic inch or 62.5 pounds per cubic foot. What kind of correspondence is that? So my friend’s claim is all the more pointed, in view of the demise of the metric standardization board in this country. If metric is so natural, why is it still struggling against traditional systems of counting and measuring in more than one part of the world? I refer here not to official government standards, but to systems in daily use among the people. If the metric system were so natural, it would only be necessary to introduce it to the people and it would immediately supplant any other system.

Still, the metric system is not without warts. First, the size of the standard weight measure seems arbitrary, no matter what system we consider. Second, the standard length measure seems arbitrary, too. That is, the kilogram and meter are themselves no more natural or useful than the pound and foot. Or the stone and ell, for that matter. Most important, the number ten is not all that convenient, arithmetically. It can be divided evenly by two and five, but not by three or four. Twenty would be a better number as the base of a counting system, as it is evenly divisible by four in addition to two and five. Twelve would be better yet, as it is evenly divisible by two, three, four, and six. Sixty, with divisors of two, three, four, five, six, ten, twelve, fifteen, twenty, and thirty, would also be advantageous, even though sixty seems a bit too large to use as the base of a counting system. Moreover, several numbers, including some of these, actually have been used as the bases of counting systems.

That is, in the English-speaking world alone, there have been several competing systems of counting and measuring in use over the centuries.

All of this leads to several questions:

1. What counting systems have been used?
2. Why have these systems been used?
3. Why have other systems not been used?

Presumably, the answers to these questions should tell us exactly what is 'natural' to the human race in terms of counting systems. The first step in seeking answers to these counting questions is the determination of the characteristics of a system. To do this, I examine the Arabic numeral system we use.[2] Having determined the characteristics of a counting system in arithmetic terms, we can look for evidence for various counting systems in the language. This requires the linguistic analysis of the names for numbers used in English. In this way I demonstrate three things:

1. five counting systems have coexisted in English;
2. all five systems are relatable to the human body; and
3. possible systems which are not used in English are not relatable to the human body.

In sum, a 'natural' counting system is one which can be derived from the original computing machine—the human body—and decimal isn't the only way to go.

Before proceeding, there are two points of confusion I wish to clear up, or rather avoid. First, in a linguistic study of numbers, a number reference, whether written in digital or alphabetic form, refers to two distinct concepts, one arithmetic (the quantity or the position on the number line), the other linguistic (the word). Therefore, in the rest of the study, I will use *10* for the quantity and *ten* for the linguistic element. Second, both of these concepts can be called numbers. To distinguish between them referentially, I call the quantity 10 a *numeral* and the word *ten* a number *name*.

1. Arabic Numerals. To determine the characteristics of a number system, consider the system of Arabic numerals, which is organized to the base 10. Its salient characteristics are easily listed.

1. There are ten distinct simple numerals: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Call this the uniqueness characteristic of the system.
2. Each multiple of the base starts a new sequence of simple numerals: 10, 20, 30, etc. Call this the multiple cyclicity characteristic.
3. Each additive of the base hits the same place in each sequence: 21 + 10 = 31, 31 + 10 = 41, etc. Call this the additive cyclicity characteristic.
4. When all the numerals in the sequence have been run through, a new sequence begins: 0, 10, 100, 1000, etc. Each of these represents a power of the base. Call this the exponential cyclicity characteristic.

These are the four arithmetic characteristics of a counting system. There must be linguistic evidence of this sort in the morphology of number names if we are to identify a counting system in the English language. Therefore I turn now to the set of number names in English to show what characteristics appear to have parallels in number name morphology. Each grouping of characteristics proves the existence of a counting system. With each identifiable system, I first detail the linguistic evidence for the system, then give the human-body source for the system, and finally give examples of the applications of the system to show that it actually has had wider influence on the lexicon of English.

2. THE DECIMAL SYSTEM. There are three major counting systems for which there is substantial evidence in the system of number names in English. The decimal system is the one with the largest amount of linguistic evidence corresponding to the arithmetic characteristics listed above; in fact, there is linguistic evidence for all of the arithmetic characteristics involved. I present this linguistic evidence in the order that the arithmetic characteristics are outlined above.

Consider first the uniqueness characteristic, the set of number names. A decimal system must have ten distinct number names, and English does: *one*, *two*, *three*, *four*, *five*, *six*, *seven*, *eight*, *nine*, and *ten*. Moreover, like the Arabic numerals, these names are morphemically simple. Both the set of Arabic numerals and the set of number names under consideration are to the base 10. Note that the unique set of number names is not derived from the unique set of Arabic numerals. Nine members of each set refer to the same quantity. But 0 'zero' is the tenth member of the numeral set and *ten* is the tenth member of the number name set. Even so, the basic set of number names in English fulfills the uniqueness requirement for a decimal system.

The second characteristic is multiplicative cyclicity. Each multiple of the base 10 is a 2-place numeral with the second numeral a 0 and the first numeral telling which multiple of ten it is. If we look at the number names for multiples of ten, we see a parallel pattern: *twenty*, *thirty*, *forty*, etc. all have two morphemes. The second is always *-ty*, which is a form of the number name *ten*. The first tells which multiple of ten it is. That is, *twen-* is a form of *two* (cf. *twin*), *thir-* is a form of *three* (cf. *third*), and so on. The multiplicative cyclicity requirement is thus fulfilled.

The third characteristic is additive cyclicity. That is, adding the base to any number produces a sum which occupies the same relative place on the next higher sequence. In other words, since 10 + 23 = 33, adding *ten* to *twenty-three* should give a number with the name *thirty-three*, and it does. Thus the additive cyclicity requirement is also fulfilled.

The last characteristic is exponential cyclicity. That is, a counting system contains a cycle of cycles: when the base number is multiplied by itself, what results is a new cycle. In numerals, this means adding a place; in language it means a unique number name. Indeed, the name for 100 is *hundred* and the word for 1000 is *thousand*, words which are unique and are not linguistically related to *ten* in any way.

All of the arithmetic characteristics for a decimal counting system are fulfilled in the set of number names in common use in the English language. This might seem like a self-evident conclusion, but there is no guarantee that the use of a decimal system in arithmetic writing (Arabic numerals) signals the use of a decimal system of counting in the language. The Arabic numerals are restricted to the representations of the mathematical system. They were introduced long after the number names in English had come into use. I show below that the use of Arabic numerals has not eliminated the other counting systems.

Now consider the source of the decimal system. The numeral 10, as remarked above, is not a particularly convenient number on which to base a counting system: it is evenly divisible by only the numerals 2 and 5. Of course, the numeral 5 has some mystical significance, as in its appearance in the pentagram. But the most compelling argument for the use of 10 as the base of a counting system is in our possession of 10 fingers, 5 on each of 2 hands. Further justification is unnecessary.

The applications of the decimal counting system are too many to be listed in full here. Our coinage, the metric system, and the readiness with which our ancestors adopted the decimal-based Arabic numerals are all evidence for the utility of the decimal system.[3]

But the decimal system does not stop here. There is also evidence for 2 other counting systems related to the decimal system. The first of these is the 'didecimal'[4] system with a base of twenty. There is a special name for twenty, that is a *score* (the uniqueness characteristic). There is also evidence for twenty as a turning point in the decimal system in English. Specifically, the linguistic element meaning ten changes form at twenty. That is, *ty* is missing the *n* of *ten/teen*.

The source for a didecimal system can easily be seen in our possession of 20 digits: 10 fingers and 10 toes. Counting by *score* has largely gone out of practice today. Indeed the practice would undoubtedly have died long since had it not been for its famous invocation in the opening phrase of Lincoln's Gettysburg Address ('Four score and seven years ago…'). In fact, the only commonly-used relic of the didecimal system is the unit of weight measure known as a *ton*, which is equal to a score of hundredweights. There are other didecimal terms for types of money (double sawbuck, double eagle), but they are no longer in common use.

The didecimal system has fewer applications and less linguistic evidence for its existence than the decimal system. But this is only reasonable. After all, for many months of the year, our northern European ancestors would have had their feet wrapped against the cold. Thus their toes would not have been available for counting.

The other counting system subordinate to the decimal system is the semidecimal system to the base *five*. There is a native English name for a group of *five*, a *handful*, which points directly at the human body source of this (sub)system. Very few applications of the semidecimal system survive. The only ones in common use besides *handful* are *fifth*, which originally referred to a fifth of a gallon, and *nickel*.

In short, the decimal system and its two subsystems, all of which derive from different ways of looking at our digit count, constitute one natural means of counting. But there are others. I now turn to one of these, the duodecimal system.

3. THE DUODECIMAL SYSTEM. There is less evidence in the English lexicon for a duodecimal system than for a decimal system, but there is a substantial amount. The uniqueness characteristic is fulfilled by the simple names for the first 12 numerals, specifically *one* through *ten*, as listed above, and *eleven* and *twelve* besides. The fact that *eleven* and *twelve* were not originally morphemically simplex is irrelevant here: one needs specialized etymological information to demonstrate the complexity. To the normal native speaker they are simplex. Moreover, it is only after *twelve* that the *teens* begin, and there is a special name for a unit of twelve: a *dozen*.[5] There is also a special name for 12 × 12 or 12^2: a *gross*. Exponential cyclicity is thus fulfilled. There is no evidence for additive cyclicity (characteristic 3), but there is evidence for multiplicative cyclicity. The number names *dozen* and *gross* act just like numerals in multiples. That is, we say '2 dozen' or '3 gross', with singular *dozen* and *gross*, just as we say '2 hundred'. This differs from normal, nonnumeral words like *book*, which always occur in the plural here: '2 books'. Thus two of the four arithmetic requirements are fulfilled completely and a third is partly fulfilled. This is sufficient evidence for us to posit the existence of a duodecimal system.

For a long time, the human body origin of the duodecimal system was a mystery to me. I had thought that this system was an exception to the general rule in that it had no relation to the human body and was based solely on the mystic nature of the numeral 6. In fact, the duodecimal system goes back at least to Babylon and probably to Sumer, and it might be interesting to review some of that history now.

Consider first the mystic nature of 6. The numeral 6 is evenly divisible by the numerals 1, 2, 3, and 6. The sum of these numerals is 12 or 2 × 6. This makes both 6 and 12 very special numerals with deep mystical significance. In addition, notice that the number of days in a year is at most 6 days more than 360, which is 6 × 6 × 10. That is, the number of days in a year is the mystic number 6 multiplied by itself and by the number of fingers, itself twice the mystic number 5. Clearly, this was not to be explained as a mere coincidence. Instead, the gods must have intended that the year should have 360 days, with the extra days set aside as a festival. This is also why a circle is divided into 360°. The significance of 6 was also clear to the ancient Hebrews. There were 6 days of Creation followed by 1 day of rest. This constituted the basis for the week. Although the week superficially seems to be based on 7, it is actually based on the 6 + 1. Furthermore, the 6 + 1 corresponds to the division of non-astral bodies in the sky: 5 visible planets (Mercury, Venus, Mars, Jupiter, and Saturn) plus the moon in the night sky and the solitary sun in the day sky. The arithmetic identity $6 + 1 = 7$ cannot override this combination of belief and observed fact to make *six* plus *one* psychologically identical to *seven*; the distinction is an important one. Furthermore, 12 tribes of Israel and the Number of the Beast in the Old Testament and the 12 Apostles, 72 disciples, and 12 fruits of the Holy Spirit in the New Testament all show the recurrent force of 6 and 12 in the Bible.

Still, the human body source of 12 was a mystery until I saw a woman from the Pakistan-Afghanistan border country counting on her fingers. With her right hand only and using her thumb as a counter, she tapped each of her finger sections in sequence, starting with the outermost section of her little finger and ending with the innermost section of her index finger. Thus the human body source of the duodecimal system derives from the ability of the opposable thumb to touch 12 finger sections.

There are many applications of the duodecimal system: 12 inches in a foot; 12 sidereal months in the year; 60 or 12 × 5 (a *dozen* times a *handful*) minutes in an hour or seconds in a minute; 24 or 12 × 2 hours in a day; 6-sided dice; and 12 ounces per pound in troy weight. There are also fractional uses: 1 fathom is 6 feet or half of 12 feet; 1 yard is 3 feet, which is one-fourth of 12 or one-half a fathom.

Moreover, the duodecimal system has retained its hold over the decimal in one area, even in those lands where metric otherwise holds supreme, like France: the measurement of time. As noted above, the number of seconds in a minute, of minutes in an hour, and hours in a day are basically duodecimal. Why not a metric clock? 100 seconds in a minute, 100 minutes in an hour, and 10 hours in a day. This would give 100,000 seconds in a day. Under our duodecimal clocks, we have 60 × 60 × 24 = 86,400 seconds in a day. A decimal second would be .864 of a duodecimal second, which is not a major discrepancy. In fact, decimal clocks were constructed in France during the 18th century, and I am told some of them, still working, can be found in museums there. Moreover, the decimal second would be closer in size to a human heartbeat than the duodecimal second is. But decimal timekeeping was never even a minor threat to the duodecimal.

Thus, both by the lexical evidence and by its applications, the duodecimal system is every bit as natural a system of counting as the decimal system. Nor is it the only alternative to the decimal system. Another strong alternative is found in the binary system, to which I now turn.

4. THE BINARY SYSTEM. The simplest possible counting system is a binary system. It has only two numerals (0,1), but you can do anything with it arithmetically that can be done with a decimal system. The English language abounds with evidence for an ancient and well-used binary counting system. Let us consider that evidence now.

First, there are obviously unique and simple names for 1 and 2. These names are also found in the decimal and duodecimal sets, but this does not matter. What matters is that they satisfy the uniqueness requirement.

Second, the English language has many special names for groups which are the size of the base, e.g., *twin*, *pair*, *couplet*, *duo*, and *couple*, to name a few. Some of these are native words, others have been borrowed. Some are very general in meaning, others very specific. For example, a *couple* indicates 2 of anything; a *couplet* is 2 closely related lines of verse in poetry. But these distinctions cause no difficulties, as the base numeral has a unique name. This is also part of the exponential cyclicity characteristic, to which I return below.

The requirements for additive and multiplicative cyclicity are not met in the binary system. The reason for this is that they are superseded by other factors. Remember that additive cyclicity applies between 10 and 10^2. There is only one number between 2 and 2^2, so there is only this one opportunity to get evidence for additive cyclicity in the binary system. If the evidence is lacking here, it will be found nowhere else. But the lack of evidence for additive cyclicity here is not crippling, and in fact it fits with certain other indications. Recall that there is no word like **oneteen* for 11. This is because 11 has the name eleven, which is part of the basic set for the duodecimal system. Extrapolating from this example predicts that evidence for additive cyclicity in the binary system will be lacking. That is, binary 11 is already 3 in all the other counting systems, where it has the number name *three*. This name supersedes any binary equivalent name, just as duodecimal *eleven* supersedes decimal **oneteen*.

The lack of evidence for multiplicative cyclicity is less troublesome. Note that multiplicative cyclicity overlaps with the exponential cyclicity in the binary system. That is, $2 \times 2 = 2^2$. What happens in such a case is that exponential cyclicity supersedes multiplicative cyclicity. Thus we have names for 4 or 2^2 (= binary 100), e.g., *foursome* or *quartet*, and for 8 or 2^3 (= binary 1000), e.g., *octet*. This parallels what happens in the decimal system: we say *hundred* and not **tenty*, and although itis possible to say *ten hundred*, *thousand* is now the normal number name. Thus, in the decimal system, wherever the exponential cyclicity and the multiplicative cyclicity overlap, the former takes precedence. In the binary system, exponential cyclicity and multiplicative cyclicity overlap everywhere between 2 (= binary 10) and 4 (= binary 100). The exponential cyclicity should take precedence, so there should be no evidence for multiplicative cyclicity in the binary system. And there is not. But there is minimal evidence for *four* as a breaking point. The allomorph of ordinality becomes *-th* for the first time at *fourth*. It is just not clear whether this is evidence supporting multiplicative or exponential cyclicity.

In sum, given the particular arithmetic qualities of the binary counting system, there is as much linguistic evidence for a binary system in the English lexicon as possible. It could even be argued that the evidence for the binary counting system exceeds the evidence for the duodecimal system, because it fulfills a higher percentage of the possible requirements.

The human body source for the binary system is again obvious. Not only humans but all higher orders of the animal kingdom display bilateral symmetry. More to the point, our counting organs come in pairs.

The applications of the binary system are extensive in the area of weights and measures. For example, 2 gills make a cup, 2 cups make a pint, 2 pints make a quart, 2 quarts make a magnum, and 2 magnums or 4 quarts make a gallon. These correspondences may seem annoying from a decimal point of view, but they are perfectly reasonable and simple in the binary system.

Now consider the distance measure. 2 steps make a pace. Traditionally, the military standard required (and requires) a single step of 30 inches or 2.5 feet. A pace is thus 60 inches or 5 feet. Our word *mile* is from the Latin expression *mille passuum* ‘thousand paces’ or 1000 x ((step length) x 2). The mile was originally 5000 feet, a combination of semidecimal, decimal, duodecimal, and binary systems.

Shifting to music we find everything based on binary. The basic unit of pitch is an octave consisting of 8 (2^3 = binary 1000) notes. The basic unit of timing is given in binary divisions of the whole note: half notes, quarter notes, eighth notes, and so on.

The unit of weight, the pound, is divided into 16 (2^4 = binary 10,000) ounces, and thus properly belongs to the binary system as well. It is here that we also see the emergence of liquid measure-weight-volume correspondences. As the old saying has it, ‘A pint’s a pound the world around.’ Thus a cup is 8 ounces and a gill is 4 ounces; a quart is 2 pounds or 32 ounces and a gallon is 8 pounds or 128 ounces.[6] At the same time a cubic foot of water weighs 62.5 pounds. This means that 8 cubic feet of water (a cube of water 2 feet on an edge) holds 500 pints or 500 pounds (= 1/4 ton) of water. There is no evidence to my knowledge that these correspondences were deliberately established; surely they were not. But the correspondences are too regular to be merely random, and I would argue that they evolved naturally and exist because they fit so well into so many systematic niches in the foot-pound-second system.[7]

It is clear, then, that the binary system of counting has a long history with many applications and has interacted extensively with both the decimal and duodecimal systems. In fact, I submit that the binary system may be even older than the duodecimal. But the accuracy of my suspicion here does not affect the main line of reasoning: the binary counting system is old and well-used. Nor is it merely a fossilized remnant of some prehistoric era. We all know that computers operate in the binary mode.

These are the 3 systems of counting and measuring for which there is evidence in the lexicon of English. Before concluding that all counting systems are based on some human-body correspondence, I must pause for a short aside on the nature of proofs.

5. On the Nature of Proofs. In logic you may be able to begin a proof with a previously proved theorem or a simple hypothesis and proceed step by step to a conclusion. In the case of a simple hypothesis, showing that you can reach a given conclusion from the hypothesis is sufficient. Empirical verification can be developed by showing that the hypothesis is indeed true and by testing for the occurrence of new data as predicted by the conclusion.

The present case, however, differs from this. The hypothesis is not simple: 'all English counting systems are relatable to the human body' is universally-quantified. It requires proof that all the counting systems that occur are relatable to the human body *and* that no systems can occur which are not relatable to the human body. The former is the positive proof; the latter is the negative proof. Sections 2, 3, and 4 show the counting systems that occur in English and the fact that they derive from the human body. Since no other counting systems can be found for English, I consider the positive proof complete. It is now necessary to complete the negative proof.

6. THE NEGATIVE PROOF. Nero Wolfe was fond of saying that it is impossible to prove a negative. In fact, it is possible to prove a negative statement, so long as it has a relatively small set of circumstances to be tested. What faces us here, though, is a universally-quantified negative. That is, I have to show that each and every number which is not related to the human body cannot become the base of a counting system. This is the type of negative statement that Nero Wolfe was referring to. It is indeed impossible to prove.

However, it can be shown in detail that the weight of evidence supports this negative statement while there is no evidence against it. But in the interest of brevity, I will make a simplifying assumption and concentrate only on the numeral 7 and its multiples 14, 21, and 28. Except for the bases discussed above, 7, 14, 21, and 28 are the only numerals between 1 and 30 which show signs of having been used for enumeration purposes.

Consider 28 first. It is like 6, in that the sum of its factors is double itself. That is, 1 × 28 = 2 × 14 = 4 × 7, and 1 + 28 + 2 + 14 + 4 + 7 = 56. Moreover, 28 is the minimum time for a lunar month and the number of days in the normal human oestrus cycle. But it is not used as the base for any counting system, in spite of the fact that 13 × 28 = 364, a better approximation to the length of the year than 360. Still, in spite of its advantages and mystic significance, 28 has not made it as the base of a counting system.

Consider instead 7. It is one of the factors of 28, and if it were the base of the counting system, 28 would automatically be included in that system, and its mystic significance would be captured. Beside its status as a factor of 28, 7 has entered into our culture as a lucky number. There are 7 sacraments, 7 cardinal virtues, 7 deadly sins, and 7 days in a week. 4 7-day weeks is the minimum time necessary for a lunar month and 52 7-day weeks is 364 days. But apart from the week, which can be interpreted as a (6 + 1)-day week, there is nothing that is reckoned by 7's. There used to be a special numerical name for a week, a *sennight*, but it has fallen out of use. The same goes for *fortnight*, the name for a 2-week period. Note, however, that this argument is vitiated by the fact that the name is derived from a decimal number name (14 nights). With 21, there is even less to say: it occurs only as the winning point in certain games. But here it is the goal rather than the base, and this use can be ignored. Thus, in spite of their mystic nature and potential usefulness, the evidence indicates that these three numbers are just not taken advantage of.

In fact, the situation is worse than this. There is at least one unit of measure that should be counted in groups of 7 and is not. I refer here to the musical scale. What we call an *octave* is in fact a *septave*. That is, 7 whole tones separate any 2 musical notes an 'octave' apart. The intervals from *mi* to *fa* in a major key and from *ti* to *do* are only halftones. All other notes in the scale are separated by whole tones. This total of 5 whole tones plus 2 half tones makes only 6 whole-tone intervals separating the 7 full tones in an 'octave'. Moreover, some music has been composed for the septave or whole-tone scale, as it is called by musicians. Yet this music remains largely unknown and is only rarely performed. In short, the numbers 7, 14, 21, and 28 have two things in common: there is nothing on the human body that numbers 7, 14, 21, or 28,[8] and there is no counting system based on any of them.

The same can be said for all the remaining numerals between 1 and 30, both those with mystical significance, like 9 or 13, and those without mystical significance, like 23. For this set of number names, then, the case is complete.

As another simplifying assumption in the discussion, I appeal to the millenium and a half history of the English language and assume that anything which has not turned up as the base of a counting system in that time will not turn up as such a base in the future. 'It could still happen' might be a reasonable act of faith, but this is a scientific essay.

Now the lack of evidence for any systems without human body correspondence is universal over the set of numerals defined. I believe it is universal over all numerals and cultures. But if anyone can show me evidence to the contrary, I will happily abandon my hypothesis.

There is one more body of data to be tapped to its full: units of measure. The organized attempt to find counter evidence by examining numbers individually failed. But there may still be evidence around. If there is, it should be in the units of measure. I turn now to an examination of these data.

7. Units of Measure. A quick survey of the traditional units of measurement shows a terrible mish-mash, except, presumably, for the metric system. The meter is currently defined as 1,650,763.73 wavelengths in a vacuum of the orange-red radiation of Krypton 86. This is surely arbitrary, unique, and stated with sufficient precision to satisfy any requirements of scientific objectivity. It seems highly unlikely that any other unit of measurement would correspond to the meter accidentally.

Conversely, consider the inch, the span (= 8 inches), the foot, the cubit (= 14 to 21 inches), the yard (= 3 feet or 36 inches), and the ell (= 45 to 54 inches). The name 'foot' suggests its origin: it is roughly the length of the owner's foot, which is a convenient unit of measure for anything on the ground. Somewhat less obvious is the source of the span and the cubit: the former is a contraction of *hand-span*, the distance from thumb-tip to the tip of the outstretched little finger, and the latter is from *cubitus*, the Latin for 'elbow' and represents the distance from the elbow to the wrist or the knuckles (which set?) or the fingertips. The yard is the distance from fingertip to nose, and the ell is the distance from the fingertips of 1 hand to the elbow of the other arm. Finally, the inch is the length of the first joint of the index finger. Given these sources for the traditional units of measure, it is easy to understand the wide degree of variation in them and their strange sizes, sizes which do not really correspond to each other. There is no real interconvertability. The inch equivalents of the larger units of measure were developed later but were originally approximate; even today, they do little to help.

Amid this chaos, the stability of the meter is refreshing, even if the length of the Kr86 red-orange line and the ratio 1,650,763.73::1 mean exactly nothing (= 0) to the average speaker of English. Of course, we must remember that the meter has a checkered history. The meter was originally intended to be 1/10,000,000 (10^{-7}) of the distance from the North Pole to the Equator. But when the accepted value of this distance was discovered to be in error, the standard length for the meter was changed to the distance between 2 scratches on an iridium bar kept at constant temperature and pressure in a cave in France. In 1960, when it was possible to control the length of the meter more precisely, the current equivalent was adopted. The meter is apparently unique among all units of measure in not originating with a human body part.

However, if the height of a human being is about 2 yards or 1 fathom, the height of human living space is roughly two meters. I am told by architect friends that it has been so for some time, since long before the invention of the metric system in the late eighteenth century. This suggests that the meter—or something of the same size but with a different name—has been around for a long time. Indeed, the meter is approximately the distance from the fingertips of one hand to the opposite shoulder. This is precisely the length of the longbow arrow known as a clothyard shaft. Thus the *clothyard* was renamed the *meter*, standardized in length, and chosen as the basis of the metric system.

In short, every standard unit of length used in the English language is derivable from a human body measurement. By itself, this is not only unremarkable but purely reasonable, from the viewpoint of a pre-technological society. Moreover, the correspondences, where they existed in anything like a stable fashion, are similarly interesting and reasonable: the relationship of inch to span is binary in nature, of inch to foot is duodecimal, of inch to yard is duodecimal, of cubit to yard is binary, of foot to yard is duodecimal, etc. These facts should be borne in mind as we turn to a summary discussion of the significance of the types of counting systems.

8. DISCUSSION. I have demonstrated the occurrence of 5 distinct counting systems in English, grouped as 3 major systems (decimal, duodecimal, and binary) with two others (semi- and didecimal) classified as subsystems of the decimal system. All but the binary system are based on a number which has mystical significance, and all

SMALLER COIN	LARGER COIN	MULTIPLIER	SYSTEM
farthing	ha'penny	2	binary
farthing	penny	4	binary
farthing	thruppence	12	duodecimal
ha'penny	penny	2	binary
ha'penny	thruppence	6	duodecimal
penny	tuppence	2	binary
penny	thruppence	3	duodecimal
penny	sixpence	6	duodecimal
penny	shilling	12	duodecimal
tuppence	shilling	6	duodecimal
thruppence	sixpence	2	binary
thruppence	shilling	4	binary
penny	half crown	30	decimal and duodecimal
tuppence	half crown	15	(semi)decimal
thruppence	half crown	10	decimal
shilling	crown	5	(semi)decimal
shilling	pound	20	(di)decimal
crown	pound	4	binary

Table 1. The Pound Sterling.

without exception have a human-body correspondence. Conversely, other mystic numbers which have no human body correspondence do not occur as the base of a counting system.

By themselves, these facts prove only that the correspondence between the human body and viable counting systems is possible, even likely. They do not prove that a system unrelated to the human body could not develop spontaneously. But it would be unreasonable and non-scientific to cling to the hope that such a development will occur. The evidence from the systems that do occur, from the measure systems, from the supposedly independent metric system, and from the musical system, which actually was developed independently of the others, all points to the same conclusion: the counting systems in use have human-body correspondences. Thus English morphology mirrors human morphology. Even if the total evidence is not absolutely conclusive, it is certainly overwhelming, and I find it persuasive. Moreover, the conclusions explain something which has long been a mystery to Americans: the traditional British monetary system, which can now be clarified.

The main units of the traditional British monetary system include the farthing, ha'penny, penny, tuppence, thruppence, sixpence, shilling, half crown, crown, and pound. At first glance, they seem to represent an incomprehensible collectionof coins of arbitrary value. However, the relationships between coins are far from arbitrary. As can be seen in table 1, every inter-coin relation can be understood in terms of the three counting systems detailed above.

The traditional British monetary system is, in short, a combination of the binary, decimal, and duodecimal systems. In fact, there are 240p to 1 pound, and:

$240 = 2 \times 10 \times 12$. Q.E.D

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[1] The ultimate inspiration for this study came from this comment, which was said to me when I was a student in Poland during a previous life. When I began working on the project, I recalled a pre-school boy who wondered why, if 11, 12 in Polish is *jedennascie*, *dwanascie*, English doesn't have *oneteen*, *twoteen* (or even *onety-one*, *onety-two*). I completed a draft many years ago and put it aside. Jim Copeland's study (1998) on the derivatives of 'hand' in Tarahumara moved me resurrect it. For a more detailed analysis of contemporary English number names and a stratificational description, see Sampson 1970.

[2] The system of Roman numerals would do as well, but the Arabic system is more familiar.

[3] I realize that the Norse also had a decimal system of number writing.

[4] Toby Griffen points out that the actual designation for a system to the base 20 should be *vigesimal.* He is, of course, correct; however, I am using didecimal because the system I describe here is, like the semidecimal system, subordinate to the decimal system. Some suspect that the didecimal system is of Celtic origin rather than Anglo-Saxon. Tim Pulyu assures me that there is insufficient evidence for this. But even if it is Celtic in origin, this is irrelevant for our purpose; it was certainly adopted by the English language. Moreover, languages like French and Russian have evidence for a didecimal system too. Though the French might also have adopted the didecimal system from the Celtic Gauls, such a claim would carry very little weight with the Slavs.

[5] *Dozen* is of French origin, but this is irrelevant here.

[6] I realize, of course, that a standard gallon of water is 8.35 pounds, which is not a particularly close correspondence. Remember, however, that the standardization of weights in the pre-modern era was anything but precise: they simply did the best they could with what they had. At the same time, a liter of water is exactly a kilogram only at 20.5° C and 1 atm. So even at the best of times, with the best technology and the best of intentions, metric correspondences are still only approximate.

[7] Sampson (1979:78–79) points out other utilitarian features of the duodecimal system.

[8] Except, of course, for the normal number of teeth in an adult, which is 28. But the total number may be as many as 32, and the actual number varies from zero in an infant to the maximum of 32 (and possibly back to zero again, because it is too easy to lose teeth to trauma, decay, or gum disease). Finally, even if a person has exactly 28 teeth, all of them are never visible at the same time. In practice, it is not easy to tell

exactly how many teeth an individual has. The combination of invisibility with variability makes this datum too uncertain to act as an actual human body foundation for base 28.

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1997 PRESIDENTIAL ADDRESS

PHONETIC AND PHONEMIC CHANGE REVISITED

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1. Preliminaries. Before the advent of phonemic theory, of course, all consideration of sound change in language was concerned exclusively with phonetic types of change, though there were some well-known precursors of phonemic ideas, such as Henry Sweet and Jan Baudouin de Courtenay.[1] By the 1930s, however, synchronic phonology had developed far enough so that the first papers on what came to be called phonemic change began to appear. The title of this paper alludes to what appears to have been the first article on that subject by an American linguist. It was a paper by Archibald A. Hill from a 1936 issue of *Language*, one which got reprinted more than twenty years later in Martin Joos's renowned anthology *Readings in linguistics* (1957). As is well known, however, the earliest work on that subject was by Roman Jakobson using the Prague model of phonology rather than the American version. The paper now available in English translation as 'Principles of historical phonology' originally appeared in German in a 1931 issue of the Prague *Travaux*. Still earlier, in 1929, Jakobson published (in French) a more specific discussion of the impact of Prague phonology on the understanding of sound changes in Russian and other Slavic languages.

Within the American context, Hill's contribution is significant for noting that the approach to sound change in Bloomfield's textbook *Language* was essentially phonetic, in that it just assumed that the earlier work could be captured under the slogan 'phonemes change' (1933:351). Hill then went on to note various examples of differences between phonetic and phonemic change, using materials primarily from English and its dialects, his primary areas of expertise.

Just two years later, Freeman Twaddell published his 'A note on Old High German umlaut' (1938), which noted specifically how a phonemic point of view could clarify seeming anomalies in the representation of umlauted vowels in manuscripts. This paper also found its way into Joos's anthology.

2. Later Neo-Bloomfieldian developments. Beyond the 1930s, the principal contributor to the study of sound change within what came to be known as (Neo-)Bloomfieldian linguistics was undoubtedly Henry M. Hoenigswald of the University of Pennsylvania. Work begun with several significant papers in the 1940s culminated in the 1960 publication of his book *Language change and linguistic*

reconstruction. When it was published, this book was regarded as the definitive statement on the subject. It dealt not only with sound change itself and its relation to reconstruction, but with other types, particularly morphological change.

Chapter 9 of the work, entitled 'Patterns of sound change', offered a detailed exemplification of the different ways that various concrete sorts of sound changes would be interpreted phonemically. It provided a name for each type and at least one example, usually from the Indo-European family. Like much of the material in the book, it drew from ideas developed in Hoenigswald's earlier papers.

3. Generativism. At about the time Hoenigswald's book was published, as is well-known, the Neo-Bloomfieldian view of phonology was being challenged by Morris Halle and others working in what was developing as the Chomskyan school of linguistics. In 1959 Halle set forth a now-famous argument to the effect that an efficient treatment of voicing in the Russian obstruents requires the abandonment of the traditional phonemic level. Whether we are prepared to accept this argument as valid or not (and some, including the present author, never did accept it), we must admit that it was destined to have a profound effect on the practice of phonology over the subsequent decades.

At this early time, however, it was not immediately evident what impact generative phonology and Chomskyan linguistics in general might have on historical linguistics. At a panel discussion presented by the University of Michigan Linguistics Club in the early 1960s, several approaches were compared. Among others, the participants included Ruth Brend as a spokesman for tagmemics, as well as an advocate of what was then commonly called 'Transformational Grammar'. In the question period, a member of the audience asked the Chomskyan spokesman what impact he felt Chomskyan linguistics would have on the historical study of language. His conclusion at that moment expressed serious doubt that it could have any impact, because he saw the availability of native speakers as essential to the preparation of a grammar according to that model. Since any historical linguistic study always involves as least one language that is no longer spoken, he reasoned, it would be impossible to apply the theory in the historical realm.

Before the end of the 1960s, however, rapid development proved this spokesman to be a poor prophet. The most significant developments included Paul Kiparsky's mit dissertation (1965), the publication of the textbook *Historical linguistics and generative grammar* by Robert King of the University of Texas (1969), as well as historical treatments of some aspects of English phonology as part of *The sound pattern of English* by Chomsky and Halle (1968). (This does not even consider the treatments of historical syntax which also began to appear.)

As part of seminar work in Slavic historical phonology, the present author attempted explicit rule formulations for both Bulgarian and Russian during his graduate study. The rules used resembled generative rules in being explicit, but they differed in not being based on a feature system, and certainly in not disdaining the phonemic level. Good examples of the kinds of accounts that grew up are found in the answer section of Cowan 1971.

The major problem with such accounts from today's perspective is that they do not represent clearly the distinction between phonetic and phonemic change. These seminar papers are by no means exempt from this criticism. In this paper, this question is addressed in greater detail and a solution is suggested.

4. Representing Phonetic and Phonemic Changes. For the Neo-Bloomfieldians, the major reason that they did not fully address this question is that Bloomfield in particular did not envision a systematic linguistic phonetics which sought to symbolize the linguistically significant differences of sound for language in general—a system that could serve as the basis for a general phonetic alphabet. For him, a 'phonetic' transcription for a language was based on phonemes, since he considered phonetics only in the physical sense, where one speaks of individual articulatory-acoustic events with infinite variability from one actual utterance to the next.[2]

Some linguists working after Bloomfield, including Pike (1943), Joos (1948), and Hockett (1955), did produce major works on phonetics, but only with still later work, most notably that of Ladefoged (1972) and his collaborators (Ladefoged & Maddieson 1996), was there an attempt to set up a full system of linguistic phonetics. So, in sum, those of Bloomfield's followers who considered historical phonology, concentrated their attentions on the phonemic aspect.

The Chomskyan phonologists, on the other hand, became committed to a system in which the traditional phonemic level was ridiculed, and in which 'systematic phonemic' (essentially morphophonemic) representations were based on the same kind of substance as 'systematic phonetic' ones (their variety of linguistic phonetics). Their relationship was treated as a kind of continuum. One would not find a clear-cut distinction between phonetic and phonemic changes from the hand of linguists who recognized no phonemic level of a sort comparable to the one under consideration here.

In summary, neither the Neo-Bloomfieldians nor the Chomskyan generative phonologists fully addressed the distinction between phonetic and phonemic changes or came up with a model capable of dealing with the different kinds of change side-by-side and in their interrelation. The Neo-Bloomfieldians concentrated their attentions on the phonemic side and commonly denied a systematic phonetic system, while the Chomskyans, true to the foundations of their view of phonological structure, denied the relevance of the classical phonemic level, and so obviously would have no interest in viewing change in relation to a structure they believed was a fiction.

5. A Proposal. The essence of the present paper is a simple proposal that we ought to model phonetic[3] and phonemic changes with a side-by-side notation. This idea

PHONETIC		PHONEMIC	
[hořtus	hik	/ hortus	hik
hasta	hui̯us	hasta	hujus
kohořs	mihi]	kohors	mihi/
[h > Ø] [UNCONDITIONAL LOSS (VIA GRADUAL WEAKENING?)]		/h > Ø/ /UNCONDITIONAL LOSS/	
[ořtus	ik	/ **ortus**	**ik**
asta	ui̯us	**asta**	**ijus**
koořs	mii]	**koors**	**mii/**

glosses:	GARDEN	THIS
	SPEAR	OF THIS
	COHORT	TO ME

Figure 1. An example of unconditional loss in Latin.

seems so obvious that it is quite amazing that nobody, to all appearances, has ever proposed it before. On one side of the page, then, we would want to show the phonetic changes in the order we believe that they occurred, and on the other side we would indicate the phonemic changes, if any, which come about as a result of the phonetic changes. In the simpler examples, they would be quite parallel, but in others, as we know, phonetic changes do not change the phonemes, or change them in different ways at the same time.

As a concrete simple example, Figure 1 shows a case of UNCONDITIONAL LOSS[4] in Hoenigswald's terms. This involves the well-known case of Latin /h/ being lost in all environments. The format also includes phonetic and phonemic representations of a small representative corpus of data for each of the stages involved. A word in which a change has occurred is shown in boldface. The box at the bottom provides the glosses for all the examples. The rules of sound change are presented in both phonetic terms and phonemic terms, with square brackets vs. slashes being used to remind the reader which is involved (for the descriptive terms as well as the formal rules). The rules use the traditional shaftless arrowhead (>) for 'historically becomes' and the environment is preceded by the ‖ (double bar) symbol, preferred by Lamb as more suggestive of 'in the environment' than the more commonly used simple slash.

The second example (in Figure 2) involves the more complicated situation which shows up with the phenomenon which Hoenigswald termed SECONDARY SPLIT. Here the example used is the palatalization of velar stops in Indo-Iranian, which initially only produced palatal allophones of the velar phonemes, but the later cen-

PHONETIC	PHONEMIC
[kid kuwid ke kos]	/ kid kuwid ke kos /
[h > č ‖ __V_{FRONT}] [ANTICIPATORY POINT ASSIMILATION INTRODUCING NEW PHONE]	/ABSENCE OF PHONEMIC CHANGE/
[**čid** kuwid **če** kos]	/ kid kuwid ke kos/
[e, o > ə] [CENTRALIZATION (WITH DELABIALIZATION) REDUCING PHONIC DIFFERENCES]	/e, o > ə/ /UNCONDITIONAL MERGER/ & /k > c ‖ __V_{FRONT}/ /SECONDARY SPLIT/
[čid kuwid **čə** **kəs**]	/ **cid** kuwid **ca** **kas** /

glosses:	WHAT	WHETHER
	AND	WHO

Figure 2. An example of secondary split in Indo-Iranian.

tralization of non-high vowels eventually led to phonemic changes because it removed part of the conditioning of the former allophonic differences.[5]

The next example (in Figure 3) involves a place where the present author's interpretation differs from that offered by Hoenigswald, and so two different phonemic versions are given. It shows two sources for the sound [ŋ] in some varieties of Latin. The development of the first is shown earlier, because it is more widespread and general—the occurrence of a velar nasal before a velar stop. This change would not have produced a phonemic difference in either view. The second change, however, produced [ŋ] from a different source in such a way that this sound could be seen to contrast with both /n/ and /g/, though only in limited environments. The [ŋ] from /n/ contrasted with /g/, while that from /g/ contrasted with /n/, though the occurrence of the former was still limited to prevelar position, and that the the latter was limited to the position before /n/. As Hoenigswald himself pointed out (1960:89), there was no environment with a contrast of all three sounds.

Still, in all, Hoenigswald was operating with a very strict variety of phonemics which always required the assignment of a particular sound to the same phoneme

PHONETIC	PHONEMIC A (HOENIGSWALD)	PHONEMIC B (LOCKWOOD)
[annus agger agnus angor pugno· winko·]	/ annus agger agnus angor pugno· winko·/	/ annus agger agnus angor pugno· winko·/
[n>ŋ ‖ __C_{VELAR}] [ANTICIPATORY POINT-ASSIMILATION OF NASALS]	/ABSENCE OF PHONEMIC CHANGE/	/ABSENCE OF PHONEMIC CHANGE/
[annus agger agnus **aŋgor** pugno· **wiŋko·**]	/ annus agger agnus angor pugno· winko·/	/ annus agger agnus angor pugno· winko·/
[g>ŋ ‖__n] [ANTICPATORY MANNER ASSIMILATION OF VOICED VELAR STOP TO NASAL]	/n>ŋ ‖__C_{VELAR}/ & /g >ŋ ‖__n/ /SPLIT FROM TWOFOLD REASSIGNMENT/	/ABSENCE OF PHONEMIC CHANGE/
[annus agger **aŋnus** aŋgor **puŋno·** wiŋko·]	/ annus agger **aŋnus** **aŋgor** **puŋno·** **wiŋko·**/	/ annus agger agnus angor pugno· winko·/

glosses:	YEAR	DAM
	LAMB	ANXIETY
	I FIGHT	I CONQUER

Figure 3. split from twofold reassignment: alternate interpretations of a Latin example.

in a given language, regardless of its environment. Consequently, he posited a variety of phonemic change termed split from twofold reassignment for such situations.

The view favored here is not so stringent. It still insists on biuniqueness between phonetic and phonemic representations, but in a variety which allows one to take the environment of the sound into account. So we can assign [ŋ] to the phoneme /n/ when it comes before a velar, but to the phoneme /g/ when it occurs before /n/. This synchronic analysis seems to make better sense, in that it avoids the overly restrictive distributions assigned to Hoenigswald's putative /ŋ/ phoneme, while still preserving what is important about biuniqueness—the unique predictability of one

PHONETIC	**PHONEMIC A** (Hoenigswald)	**PHONEMIC B** (Lockwood)
[ɔtnɔsʸil pɔdnɔsʸil ɔtplil pɔdplil ɔtbavʸil pɔdbavʸil]	/ otnosʸil podnosʸil otplil potplil otbavʸil podbavʸil/	/ otnosʸil podnosʸil otplil potplil otbavʸil podbavʸil/
$[C_{\substack{\text{OBS}\\ \text{VCD}_1}} > C_{\substack{\text{OBS}\\ \cancel{\text{VCD}}_1}} \| \_\_ C_{\substack{\text{OBS}\\ \cancel{\text{VCD}}}}]$[4] & $[C_{\substack{\text{OBS}\\ \cancel{\text{VCD}}_1}} > C_{\substack{\text{OBS}\\ \text{VCD}_1}} \| \_\_ C_{\substack{\text{OBS}\\ \text{VCD}}}]$ [anticipatory voicing of obstruents]	$/C_{\text{VCD}_1} > C_{\cancel{\text{VCD}}_1} \| \_\_ C_{\text{VCD}}/$ & $/C_{\cancel{\text{VCD}}1} > C_{\text{VCD}_1} \| \_\_ C_{\text{VCD}}/$ /conditioned merger with primary split (dual)/	$/C_{\text{VCD}_1} > C_{\cancel{\text{VCD}}_1} \| \_\_ C_{\text{OBS}}/$ /conditioned neutralization of voicing contrast/
[ɔtnɔsʸil pɔdnɔsʸil ɔtplil **pɔtplil** **ɔdbavʸil** pɔdbavʸil]	/ otnosʸil podnosʸil otplil **potplil** **otbavʸil** podbavʸil/	/ otnosʸil podnosʸil otplil **potplil** otbavʸil **potbavʸil/**

glosses:	was carried away	was carrying up to
	sailed away	sailed up to
	took away	added

Figure 4. Hoenigwald's conditioned merger with primary split: alternate interpretations of a Russian example.

representation from the other in both directions Therefore, the two phonetic changes both result in absence of phonemic change in this view.

The next example to be considered is the case which Hoenigswald called conditioned merger with primary split, and here again the preferred interpretation differs from that given by Hoenigswald. The example (in Figure 4) is an Old Russian case in which any obstruent assimilated in voicing to a following obstruent. In the rules for the sound changes, a strike-over line is used to indicate the absence of a property, so it has voiced becoming voiceless before voiceless and voiceless becoming voiced before voiced. In line with Hoenigswald's viewpoint, the /t/s which become voiced will split from the /t/ phoneme to join /d/, while those /d/s that devoice split from /d/ to join /t/. So it would be a dual case of this change, conditioned merger with primary split. In the preferred view, however, the matter is seen somewhat differently. The focus is, rather, on the fact that the voicing contrast is lost in both these cases, and in the environments where this has happened it is possible to predict whether any obstruent will be voiced or voiceless. In such cases, the neutralized result is assigned to the less marked of the phonemes, in this instance /t/. So this approach allows those cases of phonetic [d] which are in

PHONETIC	PHONEMIC
[statos dn̩t- treys tod ma·tr- kleptos tu· esti]	/ statos dnt- treys tod ma·tr- kleptos tu· esti/
$[t > t^h \parallel \begin{Bmatrix} V \\ C_{RES} \\ \# \end{Bmatrix} \_\_]$ [CONDITIONED ASPIRATION OF VOICELESS STOPS]	/ABSENCE OF PHONEMIC CHANGE/
[**stat^hos** **dn̩t^h-** **t^hryes** **t^hod** **ma·t^hr-** **k^hlep^htos** **t^hu·** esti]	/ statos dnt- treys tod ma·tr- kleptos tu· esti/
$[t^h > \theta]$ [UNCONDITIONED SPIRANTIZATION]	/ABSENCE OF PHONEMIC CHANGE/
[**staθos** **dn̩θ-** **θreys** **θod** **ma·θr-** **xleftos** **θu·** esti]	/ statos dnt- treys tod ma·tr- kleptos tu· esti/
[d>t] [UNCONDITIONED DEVOCALIZATION]	$/t > \theta \parallel \begin{Bmatrix} V \\ C_{RES} \\ \# \end{Bmatrix} \_\_/$ & /d>t/ /SPLIT FROM REASSIGNMENT OF NON-CONTRASTING PHONES/
[staθos **tn̩θ** θreys **θot** ma·θr **xleftos** θu· esti]	/ **staθos** **tnθ-** **θreys** **θot** **ma·θr-** **kleftos** **θu·** esti/

glosses:		
	PLACED	TOOTH
	THREE	THAT
	MOTHER	THIEF
	YOU (SG)	IS

Figure 5. Hoenigwald's split from reassignment of non-contrasting phones—a straight-forward example from pre-Germanic.

a position of phonemic suspension to be assigned to the phoneme /t/, while those which are in a position of contrast must be assigned to /d/. The term CONDITIONED NEUTRALIZATION OF THE VOICING CONTRAST is therefore used in characterizing the phonemic change involved here.

The next category to be considered is SPLIT FROM REASSIGNMENT OF NON-CONTRASTING PHONES in Hoenigswald's terms. Here, as in the previous category, there should be no question that a phonemic change is involved, but there can be differences as to how it is to be interpreted. The example in Figure 5 is based on the major one Hoenigswald used. Given these particular facts there is no difference in interpretation. It concerns part of the traditional Grimm's Law changes in Pre-Germanic, in which the occurrences of Proto-Indo-European /t/ that come after obstruents do not spirantize, and after the devoicing of traditional /d/, they merge with that phoneme to form what is now appropriately symbolized as /t/, while the other original /t/s become /θ/. The present interpretation does not differ, but the reasons behind it are somewhat different. For Hoenigswald, the assignment of non-contrasting phones to one or another phoneme is based squarely on phonetic similarity. It is suggested here that it would be better to make the assignment, however, in terms of markedness, assigning the non-contrasting phone to the less marked of the phonemes in question. When voicing was involved, it was assigned to /t/ because that is less marked than /d/, lacking the voicing component which distinguishes the latter. When the distinction became fricative *versus* stop, however, it would be assigned to /t/ along with the reflexes of the former /d/, because stops are less marked than fricatives.

The American English example in Figure 6 illustrates how markedness-based principles come into conflict with Hoenigswald's assignments based on phonetics alone. This concerns the development of apical stops /t/ and /d/ before /r/. In the dialects in question the stops have been palatalized to [č] and [ǰ]. In this case, there is a phonetic change, but since there is no contrast between corresponding apical stops and their affricated counterparts in the environment in question, this approach treats it as an absence of phonemic change. Hoenigswald, on the other hand, would treat it as two parallel cases of split.

As a final illustration of the application of this format, Figure 7 presents an example of some important changes in the phonology of early Old Russian.[6] The example is essentially a more complex case of secondary split than is found in the earlier example at item 2. The initial, non-phonemic change involves the introduction of allophonic palatalization of various consonants before a front vowel. This leaves the phonemic system unaffected. Then the second change involves the loss of some vowels, the phonetically reduced ones in certain environments.[7] On the phonemic side, three basic kinds of change are triggered by the single phonetic loss. Most directly, we get a conditioned loss with primary split (actually two cases of it, since two different reduced vowels are involved). Then as a secondary result of this, we get multiple secondary splits affecting the palatalized/non-palatalized conso-

PHONETIC		PHONEMIC 1 (HOENIGSWALD)		PHONEMIC B (LOCKWOOD)	
[tɪl	dɪl	/ tíl	díl	/ tíl	díl
čɪl	ǰɪl	číl	ǰíl	číl	ǰíl
pɪt	ǰəd	pít	ǰəd	pít	ǰəd
pɪč	ǰəǰ	píč	ǰəǰ	píč	ǰəǰ
tr̥ɪl	drɪl	tríl	dríl	tríl	dríl
tr̥ei̯n	drei̯n	tréyn	dréyn	tréyn	dréyn
pei̯tr̥ən	kɔldrən	péytrən	kóldrən	péytrən	kóldrən
kəntr̥ou̯l	ədrɛs]	kəntrówl	ədrés/	kəntrówl	ədrés/
$[C_{\substack{\text{APICAL}\\ \text{STOP}_1}} > C_{\substack{\text{APICAL}\\ \text{AFFRICATE}_1}} \parallel \_\_C_{\text{RHOTIC}}]$ [AFFRICATION		$/C_{\substack{\text{APICAL}\\ \text{STOP}_1}} > C_{\substack{\text{APICAL}\\ \text{AFFRICATE}_1}} \parallel \_\_C_{\text{RHOTIC}}/$ /(DUAL) SPLIT FROM REASSIGNMENT OF NON-CONTRASTING PHONES/		/ABSENCE OF PHONEMIC CHANGE/	
[tɪl	dɪl	/ tíl	díl	/ tíl	díl
čɪl	ǰɪl	číl	ǰíl	číl	ǰíl
pɪt	ǰəd	pít	ǰəd	pít	ǰəd
pɪč	ǰəǰ	píč	ǰəǰ	píč	ǰəǰ
čr̥ɪl	**ǰrɪl**	**čríl**	**ǰríl**	tríl	dríl
čr̥ei̯n	**ǰrei̯n**	**čréyn**	**ǰréyn**	tréyn	dréyn
pei̯čr̥ən	**kɔlǰrən**	**péyčrən**	**kólǰrən**	péytrən	kóldrən
kənčr̥ou̯l	**əǰrɛs]**	**kənčrówl**	**əǰrés/**	kəntrówl	ədrés/

glosses:	TILL	DILL
	CHILL	JILL
	PIT	JUDD
	PITCH	JUDGE
	TRILL	DRILL
	TRAIN	DRAIN
	PATRON	CALDRON
	CONTROL	ADDRESS

Figure 6. Hoenigwald's split from reassignment of non-contrasting phones: alternate interpretations of an example from some American English dialects.

PHONETIC	PHONEMIC
[dĭnĭ lŭbŭ lesŭ kostĭ sɛlɔ pætĭ pili gɔlɔsŭ]	/ dьnь lъbъ lěsъ kŏstь selo pätь pili golosъ/
$[C_1 > C_{\text{PALATALIZED}_1} \parallel \_\_V_{\text{FRONT}}]$ [ANTICIPATORY PALATAL ASSIMILATION, INTRODUCING NEW PHONES]	/ABSENCE OF PHONEMIC CHANGE/
[**d^{y}in^{y}i** lŭbŭ **l^{y}esŭ** **kost^{y}ĭ** **s^{y}ɛlɔ** **p^{y}æt^{y}ĭ** **p^{y}il^{y}i** gɔlɔsŭ]	/ dьnь lъbъ lěsъ kŏstь selo pätь pili golosъ/
$[V_{\text{REDUCED}} > \varnothing \parallel \_\_\_\#]$ [CONDITIONED LOSS: APOCOPE]	$/V_{\text{REDUCED}} > \varnothing \parallel \_\_\_\#/$ /CONDITIONED LOSS WITH PRIMARY SPLIT/ & $/C_1 > C_{\text{PALATALIZED}_1} \parallel \_\_V_{\text{FRONT}}/$ /MULTIPLE SECONDARY SPLITS/ & $/V_{\text{FRONT}_1} > V_{\text{BACK}_1}/$ /MUTIPLE UNCONDITIONED MERGERS/
[**d^{y}in^{y}** **lŭb** **l^{y}eš** **kost^{y}** s^{y}ɛlɔ **p^{y}æt^{y}** **p^{y}il^{y}i** **gɔlɔs**]	/ **d^{y}ъn^{y}** **lъb** **l^{y}ěs** **kŏst^{y}** **s^{y}elo** **p^{y}at^{y}** **p^{y}il^{y}i** **golos**/

glosses:	DAY	FOREHEAD
	FOREST	BONE
	VILLAGE	FIVE
	DRUNK	VOICE

Figure 7. Some stages in the development of Old Russian.

nant differences. Each of them becomes phonemic, since when a following reduced vowel is lost, the preceding consonant is now unpredictably either palatalized or not. So far this is not that much more complicated than the Indo-Iranian secondary split illustrated earlier. It just affected more consonants. But also the phonemicization of consonant palatalization caused a phonemic restructuring of the vowel system: once consonant palatalization is treated as phonemic, the differences between corresponding front and back vowels can be seen as allophonic. There is no immediate phonetic change beyond the changes affecting the reduced vowels, but the inventory of vowel phonemes is effectively cut in half in a set of unconditioned mergers that come about as a further result of the phonemicization of consonant palatalization. So the label MULTIPLE UNCONDITIONED MERGERS is used here.

6. BEYOND SEGMENTAL PHONOLOGY. What is presented above is, to be sure, only a first step in putting historical phonology on a sounder footing than it has been under the influence of the generative school. The approach is not intended to exclude important insights that emerge from different models of phonological organization. One which is quite legitimate, and has been widely adopted by various schools of linguistics that have retained the phonemic principle is appropriately termed the PRINCIPLE OF COMPONENTIATION. This is essentially the idea that phones and phonemes are not indivisible atoms, but are rather composed, either phonetically or phonemically, as the case may be, of simultaneous components. Many of our previous examples could be treated more easily under some version of componentiation, and this fact is well known. The particular view of componentiation favored here involves SINGULARY rather than the more widely-used binary properties. Such a property does not have plus- or minus-values, but rather it is simply either present or absent. Under this view, each segment in a phoneme system has one or more components, and in characterizing a phonetic system, we typically use many more components per segment than for the corresponding phonemes. Many of the examples treated segmentally in Figures 1–7 could be handled more neatly in componential terms. Some examples are shown in Figure 8. They are all the phonetic versions, but phonemic ones could likewise be presented. When phonological change is viewed in terms of these singulary components, it should be noted, many changes will involve either the loss of components or the introduction of new ones, regardless of whether a segmental loss or increment is involved.

For practical reasons, componentialized examples would be more awkward to present, though not, of course, impossible. It would in most cases not be possible, however, to present componential treatments of examples like those above in Figures 1–7 on a single sheet of paper in a readable type size, so other expedients would be necessary. The point is, of course, that there is value to considering these matters in some kind of componential terms despite the greater awkwardness of presentation that is often involved. The special value of them centers around the well-known fact that componential presentations commonly make it easier to represent generalizations than their segmental equivalents.

The next step beyond simple componentiation would be recognition of phonological elements which are prosodic in the Firthian sense: properties that

RUSSIAN VOICING ASSIMILATION	$\mathrm{Vd} > \varnothing \parallel \underset{\mathrm{Ob}}{\underline{\qquad}}\,\underset{\cancel{\mathrm{Vd}}}{\mathrm{Ob}}$ *&* $\varnothing > \mathrm{Vd} \parallel \underset{\mathrm{Ob}}{\underline{\qquad}}\,\underset{\mathrm{Vd}}{\mathrm{Ob}}$
RUSSIAN PALATALIZATION	$\varnothing > \mathrm{Pz} \parallel \underset{\mathrm{C}}{\underline{\qquad}}\,\underset{\mathrm{Fr}}{\mathrm{Vo}}$
GERMANIC ASPIRATION	$\varnothing > \mathrm{As} \parallel \left\{\begin{matrix}\mathrm{V}\\ \mathrm{C}_{\mathrm{RES}}\\ \#\end{matrix}\right\}\,\underset{\mathrm{Ob}}{\underline{\qquad}}$
GERMANIC SPIRANTIZATION	$\mathrm{As} > \mathrm{Sp}$
GERMANIC DEVOICING	$\mathrm{Vd} > \varnothing \parallel \underset{\mathrm{Ob}}{\underline{\qquad}}$

Figure 8. Componential versions of some sound-change rules.

spread over more than one segment, or at least have that potential in the language investigated. The Old Russian data of Figure 7 offers one of the better cases for this, in that we can easily look at early Old Russian as a language in which each syllable is appropriately characterized as either possessing or lacking a fronting prosody. There were no true syllable codas in this stage of the language, and the fronting element present in some syllables was manifested as a palatalization of the consonantal onset together with a fronting of the nucleus. The application of a kind of prosodic analysis to the initial data presented in Figure 7 is shown in Figure 9. The next step would be to reformulate rules of change based on these representations, but the exploration and illustration of this notion will be worked out later. It is clear, however, that the adoption of this viewpoint would require the treatment of assimilative and dissimilative changes in terms of changes in the scope of prosodic elements. In current autosegmental work within the generative school, the notion of changes in association lines connecting various 'tiers' of phonological structure would be used to treat these matters (as in Goldsmith 1990, for instance). Such association lines, however, seem clearly to be just an artifact of this particular model, and there is no reason to believe that there is any direct analog of them in the actual phonological systems of speakers. A better model came out of suggestions by Peter Reich in the 1970s, as reflected in Reich 1976 and Lockwood 1976. Both of these papers grew out of Reich's idea that phonetics (and perhaps phonology as well) involves a kind of orchestration of activities, such as could be modeled in terms of the switching on and off of various articulatory properties, like voicing, nasalization, or obstruency. In Reich's version, the reference was to 'sequential onset features', while in Lockwood's one spoke of the 'switchmatrix' as a model for

a. CONVENTIAL SEGMENTAL PHONEMES

```
/ dьnь              lъbъ
  lěsъ              kǒstь
  selo              pätь
  pili              golosъ/
```

b. PROSODIES WITH SEGMENTS

```
-F- -F-
dъnъ            lъbъ

-F                 -F-
lǒsъ            kǒstъ

-F              -F -F
so lo           pa tъ

-F F
pi li           go lo sъ
```

c. PROSODIES WITH COMPONENTS

```
--F--   --F--
Ob  Vo  Ns  Vo  Lq  Vo  Ob  Vo
Vd  Rd  Ap  Rd      Rd  Vd  Rd
Ap                      Lb
--F--                   ---F----
Lq  Vo  Ob  Vo  Ob  Vo  Ob  Ob  Vo
    Md  Sp  Rd  Do  Md  Sp  Ap  Rd
    Hi              Hi  Ap
--F--           ---F--  --F---
Ob  Vo  Lq  Vo  Ob  Vo  Ob  Vo
Sp  Md  Md      Lb      Ap  Rd
Ap
--F--   --F--
Ob  Vo  Lq  Vo  Ob  Vo  Lq  Vo  Ob  Vo
Lb  Hi          Vd  Md      Md  Sp  Rd
Hi              Do              Ap
```

Figure 9. Alternative representations of the initial Old Russian data from Figure 7.

phonetics, as an alternative to several other types such as the classical binary matrix and what Hockett (1967) had called a 'step-matrix'.

7. BEYOND RULES THE RELATE REPRESENTATIONS. The last major step that would need to be taken will only be briefly mentioned here, though it is definitely important. It involves relating sound changes, both phonetic and phonemic, to the system of relationships that actually forms the basis of the ability of people to speak and understand messages. The rules of sound change presented here are certainly useful, but they only relate a form of linguistic representation appropriate to one stage of the language to that appropriate to a later stage. Ultimately, one wants to investigate how the various systems that form part of a speaker's competence will have changed. No detailed example of such a treatment is offered here, but some important steps toward it have already been presented. One attempt in this direction was made in Lockwood 1977, but between the original oral presentation of that paper (in 1971) and its publication, further significant advances were made in William M. Christie's Yale dissertation, the essential parts were published as Christie 1977.

Ultimately, we need to go back to these matters as well, while bearing in mind also the fundamental differences between phonetic and phonemic change that have been emphasized here.

We cannot, however, gain very much from the Chomsky-Halle model, which was based on the fundamental error of assuming that derivation is an appropriate way to characterize linguistic structure. As Lamb has been pointing out since the 1960s (e.g., 1966), it was a consequence of this erroneous assumption that Halle set forth his case against the traditional phoneme. Further real progress in both synchronic and diachronic phonology should proceed from the correction of this fundamental error.

We can, to be sure, benefit from some studies based on this model, but to derive true benefit from them it will be necessary to winnow the wheat of their insights from the chaff of their erroneous anti-phonemic foundations.

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[1] A good selection of Baudouin's work in English translation is found in Stankiewicz 1972.

[2] See Anderson (1985: 262–66) for a discussion of Bloomfield's ideas on phonetics.

[3] The phonetic representations used here are based on articulatory phonetics, because this is the most easily studied and widely understood form of the science. As Professor Sydney Lamb suggested in the discussion following the oral presentation of this paper, however, a full explanation of phonetic change would require consideration of the acoustic and auditory aspects of phonetics as well, since each aspect may be involved in explaining various types of changes.

[4] The currently popular term 'deletion' has no legitimate place in linguistics apart, perhaps, from potential use in applied studies of the editing process. Diachronically, 'loss' is both shorter and more precise, and if a Latinate term is preferred, 'attrition' would be appropriate. Synchronically, this term has been applied to situations involving a zero option under either stylistic or environmental conditions. It corresponds, then, to either ZERO REALIZATION as with a zero allomorph in the plurals of English nouns like *sheep* or *deer*, or else to simple OMISSION, as when the second-person pronoun *you* is normally omitted in imperatives. See Lamb 1975 for further discussion.

[5] The two rules for phonemic changes here are shown in the same box separated by an ampersand (&). This means, here and elsewhere in this paper, that they are to be viewed as SIMULTANEOUS. Changes which must be ordered are always shown in different boxes.

[6] The interpretation is based on lectures given by James O. Ferrell of the University of Michigan Slavic department early in the 1960s. It represents a fairly well-accepted phonemic treatment of the situation, although other versions are found in the work of some authors, e.g., Fairbanks 1965, which treats the palatalization as being phonemic even before the weak reduced vowels were lost. This treatment is not logically impossible, but is usually rejected on the grounds of economy, since it multiplies the consonant inventory (already relatively large) to reduce the vowel inventory.

[7] Only part of the change is given, as in some cases it involves syncopes beyond the apocopes shown here, but what is shown is enough to make the point. Generally, a syncope occurred when a non-final reduced vowel was preceded by a syllable with a non-reduced vowels. When there was a string of two or more syllables containing reduced vowels, the odd-numbered ones, counting from the end were lost, while the even-numbered ones were retained, eventually merging in Russian with the mid vowels /e/ and /o/.

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INVITED LECTURE

VIRTUAL REALITY

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I would like to consider the following position, which is commonly accepted as a kind of default assumption about language and linguistic expressions:

(1) **A common assumption:** As a device for reporting on the nature of the world around us, language is used primarily for the direct description of events and situations. The principal nominal and relational elements of a clause refer specifically to actual individuals and an actual relationship in which they participate.

As it stands, assumption (1) is probably too vague to ever be proven right or wrong. Nor is it clear that any scholar, on serious reflection, would accept it without extensive qualification. Still, the variety and prevalence of departures from the direct description of actual relationships and individuals tend, I believe, to be greatly underestimated. It is essential that we be fully aware of the nature and extent of such departures if we desire a realistic assessment of language, cognition, and the mental construction of our world.

I am thus concerned with various kinds of indirectness in the connection between linguistic expressions and the actual individuals and relationships they pertain to. Two major sources of such indirectness will be mentioned here just in passing. The first is *implicature*, where information is obtained indirectly—via pragmatic inference—from what is explicitly stated. In (2)a, for instance, speaker B's response allows speaker A to infer that B has not in fact finished the dissertation, although B avoids saying this directly.

(2) a A: *Have you finished your dissertation?*
B: *Well, I've chosen a topic.* [implicature]
b *He hung his father on the wall above the fireplace.* [metonymy]

The second is *metonymy*, where the explicit mention of one entity provides a conceptual *reference point* serving to evoke the conception of another (Langacker 1993). In (2)b, for example, direct mention of the father serves to evoke the conception of the father's portrait, which is the intended referent despite being referred to only indirectly. Both implicature and metonymy are extremely prevalent and contribute greatly to the indirectness of the relation between linguistic expressions and the situations of concern.

The formulation in (1) makes reference to *actual* individuals and relationships. My claim is that departures from the direct description of *actuality* are ubiquitous and fundamental in language. Surprisingly much of our linguistic effort goes into the description of *virtual* entities, even when our main concern is with actual ones. (I will also speak of *fictive* entities (cf. Talmy 1996). At least for present purposes, the terms *virtual* and *fictive* can be used interchangeably.) We must therefore begin with a rough characterization of how the notion of actuality will be understood.

Actuality will be distinguished from notions like 'real world', 'reality', and 'truth'. The actual/virtual contrast can be drawn for any kind of global 'world', whether it be the 'real world' (the default) or a derivative one, like the imagined world of a myth or a novel. Sentences (3)a and (3)b are therefore taken as direct descriptions of actual, albeit mythical, events and individuals. But sentence (3)c is not. As a generic statement, it makes no direct reference to any specific individual or event in actuality. Generics are just one type of expression referring to virtual (as opposed to actual) entities.

(3) a *Adam ate an apple.*
[direct description of an actual, though mythical, event]
b *Eve eventually exited Eden.*
[direct description of an actual, though mythical, event]
c *Serpents seldom seem sincere.*
[generic; no actual individual or event directly described]

Actual and virtual entities are thus distinguished within a particular global world, as sketched in Figure 1. I find it helpful to use the metaphor of 'planes' (equivalently, we could speak of 'tiers' or 'mental spaces' (Fauconnier 1985, 1997)). Entities that are not part of actuality are visualized as occupying a *virtual plane*, which is distinct from the *actual plane* despite certain correspondences between them. For instance, the serpents referred to in (3)c, as well as their infrequent manifestations of sincerity, are located in a virtual plane describing what the world is like in general (independently of any particular individuals or events in actuality). There are numerous kinds of departures from actuality, for which distinct planes may have to be posited. I will refer to any of these as a virtual plane, as well as adopting more specific labels for some of them.

In a given world, *reality* can be defined as the history of what has happened up through the present, as conceptualized by the speaker (Langacker 1991: chapter 6). Reality evolves through time (*t*), continually 'growing' toward the future as more and more occurs. The term *ground* (*G*) refers to the actual speech event, its participants, and its immediate circumstances. The ground defines the 'present', being

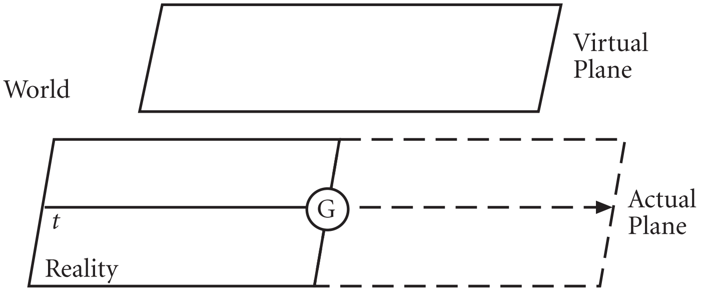

Figure 1.

located on the 'leading edge' of reality as it grows with the passage of time. Reality is one facet of actuality, which further includes the 'modal elaborations' of reality, such as the fact (as seen by the speaker) that certain events did not occur, or the likelihood of future events occurring. But even when an actual event is not accepted as real, its reality remains *at issue*. In negating a past event we are denying its inclusion among those constituting reality. A modal pertains to the likelihood of reality evolving to encompass the event in question. In either case, the speaker is assessing its status and position vis-à-vis reality.

All the sentences in (4) will thus be regarded as descriptions of actuality:

(4) a *Some unicorns trampled a Martian.* [false description of actuality]
b *She did not recognize him.* [actual but non-occurrent event]
c *They might cancel the soccer match.* [actual but only potential]
d *Joe believes a unicorn bit me.* [direct description of belief about actuality]

Actuality is taken as being independent of truth and falsity, as well as negation, tense, and modality. Although the events described in (4)a–c are not portrayed as being real, their possible inclusion in reality is precisely what is at issue. I am also willing to speak of actuality in regard to the complements of verbs of propositional attitude, e.g., *believe*, as in (4)d. The speaker is of course not asserting that a unicorn bit him, but is only describing a belief held by Joe. Still, that belief pertains to actuality (even if it happens to be false), and the subordinate clause offers a direct description of both the event and its participants.

The distinction between actual and virtual entities should become clearer as we proceed through examples. It is not absolute, and the line might be drawn in other places. My strategy here is to interpret actuality rather broadly. I hope to show that departures from the direct description of actuality are legion, even with a liberal definition. Though numerous, the types of cases to be considered are anything but exhaustive.

One of the most basic findings of cognitive linguistics is the utter pervasiveness in thought and speech of *metaphor* (Lakoff & Johnson 1980; Lakoff & Turner 1989; Turner 1987) as well as *conceptual blending* (Fauconnier & Turner 1994; Turner & Fauconnier 1995; Coulson 1996), of which metaphor constitutes a special case. In metaphor, a *source domain* is evoked as a basis for conceiving or understanding a *target* domain. The result of so doing is often a 'hybrid' (Fong 1988) or *blended* structure that inherits certain properties from both the source and the target. Suppose I metaphorically construe a theory as a building, as in (5). In so doing, I mentally create a hybrid entity that is building-like in certain basic structural respects (Clausner & Croft 1997), yet somehow ethereal or non-substantial. If my theory collapses, I may not be very happy, but I don't have to worry about being struck by a falling beam.

(5) A THEORY IS A BUILDING: *You need to buttress that theory. His theory rests on weak foundations. The framework of the theory is sound. She demolished my theory. Our theory collapsed under the weight of counterevidence.*

The relation between the planes depicted in Figure 1, on the one hand, and metaphorical expressions like those in (5), on the other, is as follows. The metaphor itself, as a general pattern of conceptual structuring, does not refer to any particular building or any particular theory, hence it is not part of actuality. It consists of various mappings, or *correspondences* (represented by dotted lines), between the source domain of buildings (or physical structures more generally—see Grady, Taub & Morgan 1996; Grady 1997) and the target domain of theories. The primary mapping, the only one shown in Figure 2, identifies a building (B) with a theory (T); at this level, of course, the corresponding entities are types or arbitrary instances, rather than any actual building or theory. Resulting from the source-target correspondences is a blend, one element of which is a hybrid type of entity, given as B/T, combining certain properties of buildings and theories. The metaphor residing in these mappings supports an open-ended set of expressions describing the metaphorical construal of theories in general or of particular theories in actuality.

The sentences in (5) describe actual situations and events involving the soundness and fate of actual theories. The specific theory being referred to in a single example is represented in Figure 2 as t_i. It is not however t_i *per se* that is conceived as being buttressed, having foundations and a framework, being demolished, or collapsing—such a conception would be anomalous. Rather, these relationships are ascribed to an imagined instance of the hybrid entity type B/T, which renders the conception coherent. This imagined entity b/t_i corresponds to t_i but does not exist in actuality. It is the virtual, fanciful correspondent of a real entity, one that instantiates the metaphor and functions in lieu of the real entity for purposes of making

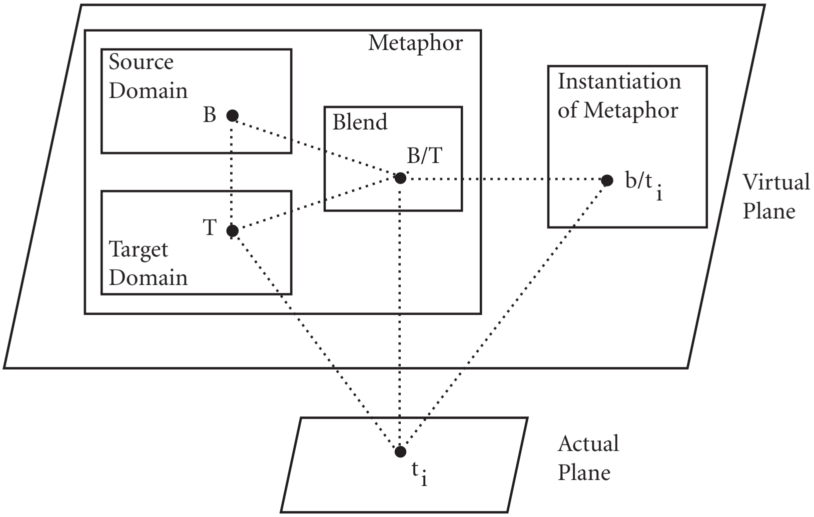

Figure 2.

the metaphorical predication. This predication is thus a *virtual* structure evoked to describe a facet of *reality*.

The essential point here is that metaphorical expressions commonly (perhaps always?) describe the blended, virtual structure, even though an actual situation in the target domain is the one we are ultimately concerned with (Fauconnier 1997: 168–71). Collocations like *demolish…theory* and *theory…collapse* are conceptually coherent in neither the source domain nor the target domain, considered individually. Only in the blended structure where a theory assumes certain building-like properties can such expressions be assembled without semantic incompatibility. We are therefore talking about theories *per se* only *indirectly*—it is the *blend* that these metaphorical expressions refer to directly. Only via and in relation to what is said about the blended structure do we draw the intended conclusions about the actual situation in the target domain of theories and their assessment. The blended structure is a kind of virtual representation created in order to indirectly specify something concerning the actual situation of concern.

Many of the phenomena discussed subsequently could also be characterized in terms of metaphor and blending. I will not explicitly present them in that fashion, simply because I want to focus on their virtual nature and the often unnoticed indirectness in what seem like straightforward descriptions of actuality. Still, the ubiquity of metaphor and conceptual blending is already sufficient to show the simplistic nature of the assumption in (1).

Perhaps the most obvious case of non-actuality is *virtual motion*. Under the alternative labels *abstract motion*, *subjective motion*, and *fictive motion*, it has been studied extensively by cognitive linguists (Langacker 1986; Matsumoto 1996a, 1996b, 1997; Talmy 1996). Talmy lists quite a number of subtypes, some of which are exemplified in (6).

(6) a *That mountain range goes from Mexico to Canada.*
b *The signpost points toward the town.*
c *The sun is shining into the cave.*
d *The pillar cast a shadow against the wall.*
e *We can be seen by the enemy from where they're positioned.*
f *I sat in the car and watched the scenery rush past me.*
g *As I painted, a line of paint spots slowly progressed across the floor.*
h *The palm trees cluster together around the oasis.*
i *Termite mounds are scattered all over the plain.*
j *The bakery is across the street from the bank.*

Consider expressions like (6)a. The motion verb *go* and prepositional phrases with *from* and *to* are of the sort that would normally be used for an object moving along an extended spatial path through time. Here, however, nothing actually moves. The mountain range is static, despite occurring as the subject of *go*, and no explicit mention is made of any potential mover. In Talmy's terms, there is *fictive* motion but the *factive* situation is one of stasis.

This can be described in various ways. It might be argued that the mountain range is construed metaphorically as moving along a path. Alternatively, one might posit an imaginary mover who traverses a path along the mountain range's expanse. I myself have said that the *conceptualizer* moves *subjectively* along this path by a process of *mental scanning*. These descriptions are not necessarily incompatible. I believe that all of the factors mentioned are involved, probably to varying degrees in different examples. Metaphorical motion by the subject seems more evident with a different choice of verb, as in (7)a. The role of an imagined mover becomes more evident with a different choice of subject, or with other adjustments, as in (7)b–c. In cases like (7)d, both the subject (metaphorically) and another mover traverse the same path. Note further that in all these circumstances the conceptualizer scans mentally along the spatial path in question. In conceiving of some entity moving along a path, the conceptualizer necessarily evokes in sequence the various locations constituting that path, and in so doing moves subjectively along it.

(7) a *That mountain range {reaches/extends/stretches} from Mexico to Canada.*
b *This highway goes from Mexico to Canada.*
c *The freeway ran along the coast for a while, then entered the mountains.*
d *This road {leads/takes} you directly to the exit—you just have to follow it.*

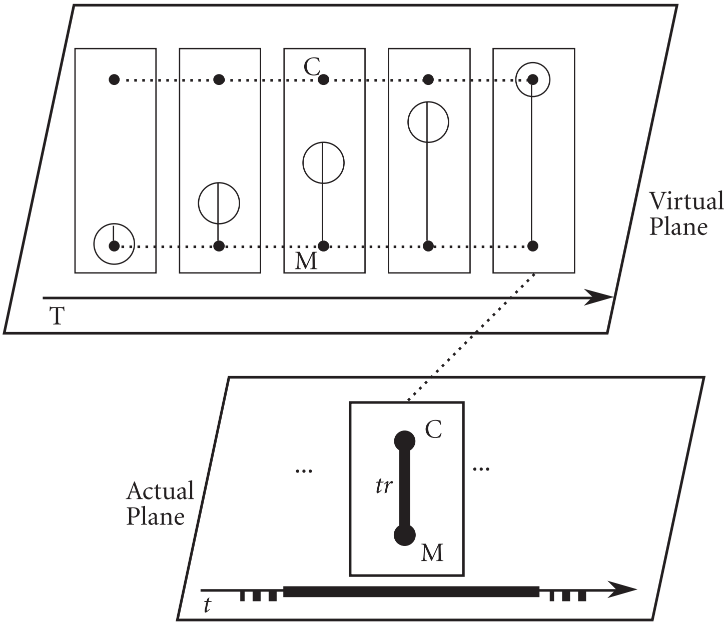

Figure 3.

As seen in F'igure 3, the conceptual characterization of (6)a has both an actual and a virtual component. In actuality, it *profiles* (i.e., designates) the continuation through time of a stable situation in which the *trajector* (*tr*), the entity coded by the subject, has a spatial extension reaching from Mexico (M) at one extreme to Canada (C) at the other. Enclosed in a box, the profiled relationship continues through a span of time (indicated by a bar along the time arrow) not conceived as being bounded. This unbounded character makes the profiled relationship *imperfective* (or 'stative'), which enables it to be expressed in the simple present tense (*goes*), even though *go* as a true motion verb is perfective and thus requires the progressive for a present-time event (Langacker 1987).

Hence the situation in actuality determines the basic aspectual categorization of the profiled relationship, with predictable consequences for its tense/aspect marking. Yet virtual motion is also essential to the meaning of (6)a; if nothing else, it provides the directionality coded by the prepositional phrases *from Mexico* and *to Canada*. But what is virtual motion? In Figure 3 I have shown it as subjective motion (mental scanning) on the part of the conceptualizer. The arrow labeled T stands for *processing time*, i.e., time as the *medium* of conceptualization (whereas *conceived time*, *t*, is time as the *object* of conceptualization). Through a span of processing time, the conceptualizer builds up to a full conception of the profiled relation by mentally scanning along a path and progressively superimposing all the locations scanned until the full configuration is simultaneously available as a single gestalt (I refer to this as *summary scanning*). The circles represent the conceptualizer's momentary focus of attention at a given instant, and each focused location brings an additional segment of the trajector (or its spatial extension) into awareness. Observe that the full configuration accessed via this virtual, subjective motion is identified with the single, static configuration in actuality whose continuation through time constitutes the profiled clausal relationship. The virtual motion, with its dynamicity and inherent directionality, is used to 'build up' the conception of a stable situation. It is this virtual motion, rather than the static situation in actuality, which motivates the use of *go* as well as the path prepositions *from* and *to*.

As noted earlier, the subjective movement just described is compatible with the other ways of interpreting virtual motion, and in fact is immanent in both of them, representing their abstract commonality. Suppose, on the one hand, that (6)a—or another example, like (7)b—is construed in terms of some imagined individual moving objectively (though fictively) along the spatial path in question. Under this interpretation, the circles in Figure 3 can be taken as representing the mover, who successively occupies all the points along the trajector's expanse. (This motion would of course occur through a span of conceived time, but a fictive span of time, not the actual time span through which the profiled relationship is tracked in the actual plane.) Yet, in conceiving of this motion the conceptualizer is inherently directing attention to successive portions of the spatial path, which can thus be summarized to yield the gestalt conception of the full configuration, as before. The notion of an individual moving along the path can be present with varying degrees of cognitive salience. 'Pure' subjective motion as previously described can be regarded as the limiting case in which this notion fades away entirely, leaving the conceptualizer's mental scanning as its only vestige.

On the other hand, suppose (6)a—or perhaps (7)a—is construed in terms of metaphorical motion on the part of the subject. In this case, the virtual plane in Figure 3 can be interpreted as instantiating the blend resulting from the metaphorical mapping (cf. Figure 2). The source domain of the metaphor is the conception of something moving along a spatial path, and its target domain is the conception of a spatially extended object (like a mountain range or a road). Correspondences link the mover, at each instant in its motion along the path, with successive portions of the extended object. The blend that results involves that object moving—or in a summary view, 'growing'—along the spatial path, just as shown in Figure 3.

The different kinds of fictive motion illustrated in (6) all deserve comparable scrutiny, but we need to move on. Virtual motion turns out to be just a special case of the much broader phenomenon of *virtual change*. One kind of virtual change, apparently quite prevalent in Japanese, has been described by Matsumoto (1996c). In contrast to (8), which describes the room's shape directly, (9) does so indirectly, by portraying it as the result of a change.

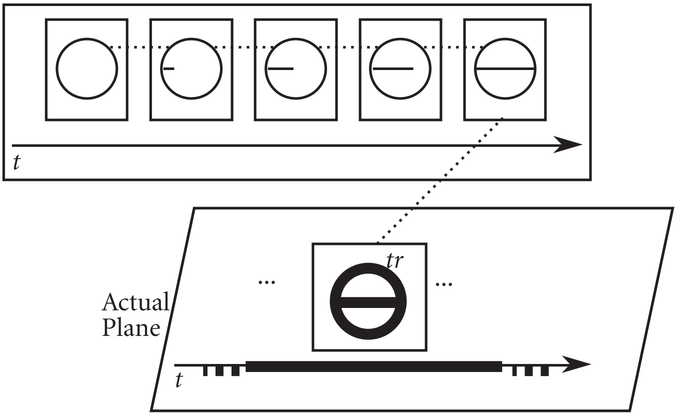

Figure 4.

(8) *Sono heya wa marui.*
the room T round
'The room is round'

(9) *Sono heya wa maruku na-tte iru.*
the room T round become-STAT be
'The room is [in the state of having become] round'

No change has actually occurred in (9). Instead, this resultant state construction describes the departure of the actual situation, where the room is round, from the ideal or canonical situation, in which a room is rectangular. A fictive event is invoked for purposes of characterizing a static situation in actuality.

Of course, a sentence like (9) is really ambiguous. It could in principle describe the stable situation resulting from the room actually changing shape, from being rectangular to being round. More likely it simply means that the room is round, without implying any change, but in contrast to (8) it nonetheless portrays that situation as a departure from the normal or expected one. The ambiguity can be explicated as a matter of whether the change-of-state process (that of becoming round, in this case) is construed as being actual or virtual.

A change-of-state process is depicted abstractly in the top portion of Figure 4. A circle represents the thing that undergoes the change of state (e.g., a room). The change in state, which can be thought of as a property progressively manifesting itself through time, is represented by a line increasing in length until it fully traverses the circle. The final state of this process—the resultant state in which the property is fully manifest—is identified as the situation in actuality that sentence (9) designates. More precisely, the sentence as a whole profiles the imperfective process wherein this stable situation is followed sequentially in its continuation through time. But if this static situation obtains in actuality, what about the change-of-state process that produces it? No indication is made in the diagram as to whether this process is construed as being actual or virtual. That is where the ambiguity lies. On the one hand, this change can be situated in the actual plane, occupying a span of time prior to that of the profiled imperfective process. This implies that the room really did undergo a change in shape. On the other hand, the change can be a virtual one, invoked to contrast the profiled configuration with the canonical one.

Another kind of virtual change, described by Talmy (1996) and Sweetser (1997), is exemplified in (10).

(10) a *His newspaper column grew longer every week.*
b *The trees got shorter at higher altitudes.*
c *The water got deeper as he swam away from the shore.*

Sweetser has noted that the interpretation of expressions like these hinges on whether a nominal expression is construed as referring to a general *role* or a specific *value* of that role (in the sense of Fauconnier 1985). At least in this context, values can be identified with actual individuals (or sets of individuals). The individual interpretations are possible in (10) but highly implausible in view of general world knowledge. On the individual reading, *his newspaper column* in (10)a refers to a specific piece of prose that took a long time to finish and was augmented on a weekly basis. In (10)b, we can imagine a particular set of trees being transported up the side of a mountain, each one shrinking as it went (for some unexplained reason). If (10)c is taken as describing an actual change (rather than a virtual one), the entire body of water increased in depth (perhaps floodwaters were rushing into a small lake).

More likely, of course, is the role interpretation, where the change described is fictive, or virtual, rather than actual. On this construal, *his newspaper column* does not refer to any actual piece of prose, but rather to an abstract entity—a role—which particular pieces of prose instantiated on particular occasions. No actual column is portrayed as changing in length. Instead, the appearance of change comes about when successive instantiations of the column are compared and observed to differ in length in a way analogous to that of a single piece of prose sampled at different times while being revised and expanded. The change is thus virtual in the sense of emerging from the comparison of different individuals *as if* they were a single individual observed at different times. Similarly, *the trees* in (10)b does not refer to any specific set of woody plants. It is a role description, referring to an aspect of the landscape observable at any given altitude. The virtual change in height is obtained by comparing different values or instantiations of this role. And in (10)c, there need be no change at all in the overall body of water or its depth at

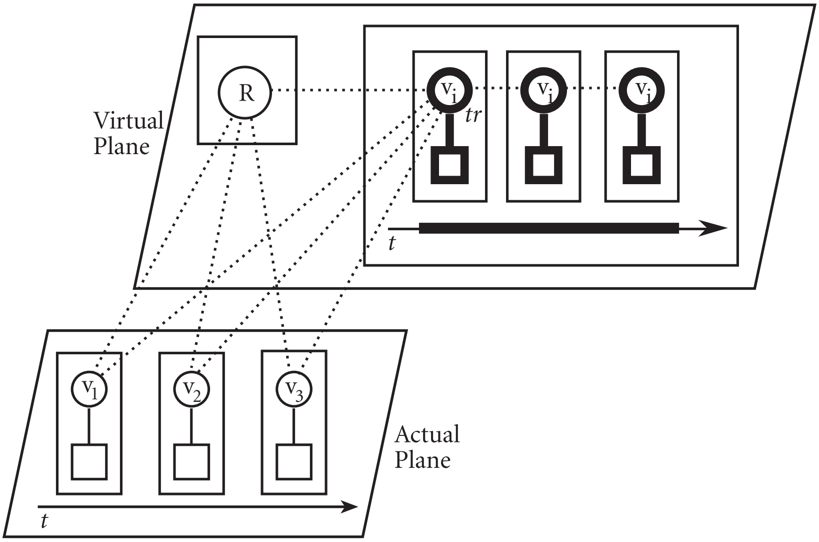

Figure 5.

any one location. Rather, *the water* is a role description referring to the local expanse of water surrounding the swimmer at any given moment. As the swimmer moves, this role is successively instantiated by distinct expanses of water, whose different depths can be perceived as virtual change.

This kind of virtual change is sketched in Figure 5. R stands for a role conception, which of course is a virtual entity rather than an actual individual. The individuals that fill this role at different points in time are given as v_1, v_2, and v_3. In the actual situation being described, each such individual, at the time in question, participates in a certain relationship (shown abstractly as a line connecting it to another entity), e.g., it falls at a certain point on a scale of length, height, or depth. These individual relationships in the actual plain fail to constitute a coherent process of the sort profiled by a clause—where a single relationship, with the same set of participants, is tracked in its evolution through time. Instead there are different participants at each moment, and it is not the case that one relationship evolves into the next. A coherent process conception emerges only in the virtual plane. It emerges when the actual individuals (v_1, v_2, and v_3), observed at different points in time, are fictively viewed as if they were the same individual, v_i. Because they involve the 'same' participant, one relationship is then seen as evolving into the next, so that the participant is conceived as changing through time. The clause profiles this virtual change.

Note that Figure 5 differs from Figures 3 and 4 in regard to the locus of the *profiled* process, i.e., the relationship that is 'put on stage' and specifically designated by the clause. In these previous diagrams, the status of profile was conferred on an imperfective process in the actual plane. By contrast, in Figure 5 profiling falls on a fictive event in the virtual plane. It is only in the virtual plane that a coherent process emerges at all to be profiled. We will see that the profiling of virtual entities is in fact quite common.

The type of virtual change depicted in Figure 5 tends to be closely associated with actual or virtual motion and the sensory impressions induced in the moving viewer. In (10)c, an actual mover is explicitly mentioned. What counts as *the water* is the expanse of water around the mover at a given moment, and since different patches of water can vary in depth, the viewer's actual motion induces the impression that its depth is changing. In (10)b no actual mover is mentioned, but on a non-generic interpretation one is strongly implied. *The trees* refers to a local feature of the landscape observable at any given point in a tacit journey from lower to higher altitudes. An imagined moving viewer seems to be as important in such examples of virtual change as it is in cases of virtual motion like (7)b–c.

I would go further and say that the conceptualizations evoked as the meanings of linguistic expressions always presuppose a *viewer* (i.e., a conceptualizer) and a *viewing arrangement* (Langacker 1995). The viewing arrangement comprises such factors as a *vantage point*, the domain being viewed (e.g., a 'world' or mental space), and how that domain is *mentally accessed*. Although the viewing arrangement is only implicit, it provides the foundation for apprehending a given situation. It thereby exerts a strong shaping influence on both the conceptualization and the form of the expression that encodes it.

In the default viewing arrangement, the viewer is the actual speaker (and secondarily, the addressee), the domain is the real world, and the viewer—from a fixed vantage point—describes events and situations in actuality. This canonical arrangement is presupposed in assumption (1). There are, however, many kinds of departure from this canon. Expressions do not necessarily pertain to the real world, nor to actuality within a given world. A vantage point can be adopted other than the speaker's actual one, and domains can be accessed in varied and complex ways.

It should be evident that some of the cases already discussed can be characterized as involving a *fictive* (or *virtual*) *viewing arrangement*. A frequent pattern, grounded in our experience as travelers, is for a moving viewer to describe what he sees *as if* he were static (as in the canonical arrangement). This produces the type of fictive motion exemplified in (11):

(11) *The telephone poles are rushing by at 80 miles per hour.*

Here the speaker is reporting on his actual viewing experience at the moment of speaking. However, he does so with respect to a virtual viewing arrangement in which the speaker is static and the telephone poles are moving, when presumably just the opposite is really the case. In other words, the sentence directly encodes (and reflects in its form) the actual experience engendered by a fictive construal of the speaker's viewing circumstances.

Slightly different is another classic example cited by Talmy (1988):

(12) a *There was a house every now and then through the valley.*
b *There is a house every now and then through the valley.*

I have varied the tense to bring out two subtly different construals. But with either tense, the sentence looks like it ought to be semantically and grammatically incoherent. It uses the adverbial phrase *every now and then* with respect to the existence of a house, but a house is not something whose existence flashes on and off like a light bulb. The adverb *through the valley* is even more problematic, since it describes a spatial path, but nothing overtly specified in the sentence is conceived or portrayed as moving.

Yet the expressions are immediately and unproblematically understood. They merely presuppose a non-standard viewing arrangement involving a moving viewer, and describe the viewing experience thereby engendered. At a given moment a person's field of view subtends only a circumscribed portion of the surrounding world, and as a person travels along a spatial path, the field of view moves along with him, subtending a different portion of the world at each moment. From the vantage point of a moving viewer, the existence of a house within the portion of the world currently being viewed is something that happens *every now and then*. Likewise, the adverb *through the valley* describes the path of the viewer (and the field of view), rather than anything explicitly mentioned. The semantic and grammatical coherence of these expressions is critically dependent on a viewer and viewing arrangement that are not directly mentioned.

Sentence (12)a, with past tense, favors the construal in which the viewing experience was that of the actual speaker, on a prior journey. Its virtuality is limited to the fact that it describes the speaker's visual impressions (what appeared in the field of view, at what intervals) rather than describing the valley directly and objectively, in its own terms. By contrast, (12)b, with present tense, favors a quasi-generic construal not based on any particular journey or any specific viewer. In generalized terms it describes what the valley is like, but it nevertheless does so from the perspective of a viewer traversing it. That viewer is simply not identified with any specific or actual individual. The viewer, the viewing experience, and the journey are virtual rather than actual.

Previous examples of fictive motion and fictive change were also seen as evoking an actual or virtual moving viewer. In (10), for instance, the past tense favored an interpretation involving an actual viewer. Once again, shifting to present tense induces a quasi-generic construal involving a generalized, virtual viewer, coded by *you* in (13)a but implicit in (13)b:

(13) a *The water gets deeper as you swim away from the shore.*
b *The trees get shorter at higher altitudes.*

These sentences describe an actual situation as it would present itself to any moving viewer at any time. The motion, the viewing, and the change they engender are all virtual, yet they provide a way of mentally accessing a facet of reality.

Once we depart from actual motion by an actual viewer, we are no longer tied to the spatial domain and the perception of physical entities. Many kinds of expressions appear to invoke a tacit virtual viewer whose movement through time or some other abstract domain provides a way of mentally accessing it. Although we cannot examine them here, the examples in (14) may hint at their range and variety. (For *still* and *already*, see Michaelis 1991, 1993, 1996.)

(14) a *The years are going by awfully fast.* [cf. (11)]
b *From moment to moment the crowd became more restless.*
c *His condition progressively worsened from one day to the next.*
d *Prices vary greatly from one restaurant to the next.*
e *Quality improves in the higher price ranges.*
f *As body size increases, the typical gestation period gets longer.*
g *Through the ages there have been many great leaders.*
h *Going down the list, every conceivable option seems worse than the last.*
i *Don't mention calculus—elementary algebra is already too advanced for him.*
j *He's not as bad as Gingrich, but Helms is still way too liberal for me.*

We have so far observed fictivity with respect to both the situation described and the implicit way of viewing it. In a more speculative vein, I suggest that we might also posit *virtual speech acts*, i.e., fictivity at the level of illocutionary force. I characterize a conventional speech-act value as residing in a *schematized interactive frame*, abstracted from specific speech events in the same way as any other kind of linguistic unit. These frames make schematic reference to the speaker and hearer, to an utterance, to relevant facets of the context, and to such factors as the intent of the interlocutors and the assessment of each interlocutor concerning the intent and previous knowledge of the other. For example, the frame for assertion embraces such notions as the speaker's intent to establish a proposition in a certain mental space (in particular, some conception of reality), canonically for the purpose of inducing the hearer to accept it as part of that space. A substantial inventory of conventional frames are presumably available for speakers to use in actual discourse. When such a frame is used, an appropriate clause is plugged into it and the whole complex is activated in the context of the actual speech situation. Aspects of the situation thus instantiate the frame's schematic specifications (e.g., the actual speaker and hearer instantiate the schematic roles of speaker and hearer).

In a fictive speech act, the speaker in some sense pretends to employ the interactive frame but does not fully identify its elements with those of the actual interaction constituting the ground. Instead, the entire complex (frame plus clause) is embedded in another interactive frame that is identified with the ground and specifies the actual nature of the intended interaction. We often do this for irony, as in (15):

(15) a *That was a brilliant move.* [in response to something obviously stupid]
b *He will finish his dissertation on time. And I will be elected pope.*

Here the speaker only pretends to make an assertion. By making its content the opposite of what is manifestly true, or coordinating it with another apparent assertion that is blatantly false, he signals that his actual intent is not to induce the hearer to accept the proposition as true, but merely to put it on stage for examination. The supposition, of course, is that its patent falsity will make it evident how silly it would be to even consider asserting it in actuality. The examples in (16) illustrate another familiar pattern:

(16) a *Who needs that car?* [= 'Nobody needs that car.']
b *Why should he tell the truth?* [= 'He has no reason to tell the truth.']

Here the speaker only pretends to ask a question. The actual interactive intent is not to elicit an answer from the hearer, but to render evident the impossibility of providing a truthful answer that satisfies the question's existential presupposition. A virtual act of questioning is incorporated as part of a higher-level interactive frame with a different projected outcome. The relation between the expression and the actual interaction envisaged is only indirect.

A basic point emerging from the discussion thus far is that an expression's overt content—what it directly and explicitly mentions—is only one facet of the elaborate conceptualization that constitutes its meaning. The overtly mentioned elements are apprehended in terms of an implicit viewing arrangement, and this entire conceptual complex is embedded in a tacit interactive frame. These implicit layers of conceptualization are essential ingredients of an expression's semantic value and play a major role in shaping its form. Moreover, structures at any level—content, viewing arrangement, interaction—can be virtual rather than actual.

I would next like to consider the English present tense. Elsewhere (1987:82) I have argued for the following, 'naive' characterization of the English present:

(17) **Present tense**: A full instantiation of the profiled process occurs and precisely coincides with the time of speaking.

I still believe that characterization to be valid. However, it does require a certain amount of clarification and reinterpretation (which various discussions with Mariko Higuchi Goto have helped me arrive at). It turns out that virtual entities are crucial to understanding the English present tense.

It is a truism of modern linguistics that the English 'present' is not a real present tense marker in the sense of indicating that an event occurs right now, at the time of speaking. Two considerations make this seem quite evident. First, the simple present cannot be used for perfective verbs; to indicate the occurrence right now of a perfective process, the progressive has to be employed:

(18) a **She does her homework right now.*
b *She is doing her homework right now.*

Second, the present is commonly used for events that do not occur at the moment of speaking. Some representative cases are the 'scheduled future', 'stage directions', and 'timeless' statements of general validity:

(19) a *Our plane leaves at noon.*
b *Hamlet moves to center stage. He pulls out his dagger. He examines it.*
c *A wombat is a marsupial.*

I suggest, however, that this truism is in fact false, and that the naive characterization—properly understood—is the correct one.

It should first be noted that the naive characterization provides an explanation for why present tense perfectives are normally bad. A perfective process is bounded, and a full instantiation of such a process includes its endpoints, i.e., the profiled relationship is tracked from beginning to end in its evolution through time. Thus, for a perfective process to precisely coincide with the time of speaking, its initiation has to coincide with the onset of the speech event, and their completion must also be coincident. This poses both a *durational* problem and an *epistemic* one. The durational problem is that there is no inherent connection between the length of the event described and the length of the speech event describing it, e.g., it takes longer to do one's homework than to utter (18)a. The epistemic problem is that one has to observe an event in order to identify it as a prerequisite to describing it. But by the time an event is observed and identified, it is already too late to initiate a speech event that precisely coincides with it. These problems do not arise with present-tense imperfectives, since imperfectives (including progressives) are 'mass-like', so that any portion of the overall process counts as a full instantiation of the process type. So given an ongoing, already identified imperfective process, that portion of it which coincides with the time of speaking counts as valid instance, as required by (17).

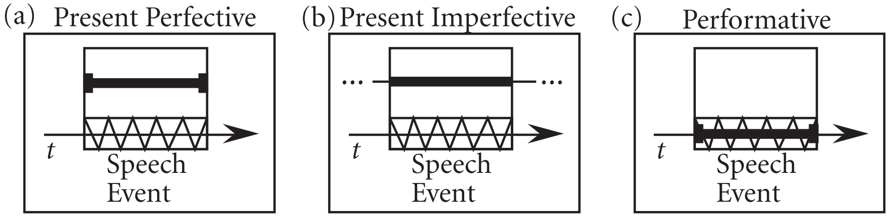

Figure 6.

These characterizations are sketched in Figure (6)a–b. Observe that the present-tense perfective configuration is conceptually coherent. The problem with present-tense perfectives is simply that, owing to the durational and epistemic problems, this configuration normally cannot arise.

A systematic exception to the non-occurrence of present-time perfectives is *performative* sentences:

(20) a *I order you to destroy those files!*
b *I promise to give up smoking.*
c *I hereby pronounce you husband and wife.*

This exception is predicted by (17): since a performative sentence is one that designates the very speech act effected by its utterance, the profiled process and the speech event temporally coincide as a matter of definition. This configuration is shown in Figure (6)c. Moreover, the epistemic problem fails to arise because the actor is none other than the speaker, who acts with prior intention.

We see, then, that the naive characterization in (17) explains a lot, even as it stands. In particular, it explains the acceptability of present-time imperfectives, the general non-acceptability of present-time perfectives, and the exceptionality of performatives in this regard. But what about all the cases, like (19), where the event does not occur at the moment of speaking? The answer, in brief, is that the occurrence of the event in question may be a *virtual occurrence* involving a special *viewing arrangement*. In the context of the presupposed viewing arrangement, the event's virtual occurrence *does* coincide with the time of speaking.

Consider first the use of the present in play-by-play descriptions of sporting events and the like, as in (21):

(21) *Jordan passes to Pippin. He pulls up and shoots. The ball rims out.*
Rodman grabs the rebound.

The clauses are perfective and are employed for the description of actual events, as they occur. In using the present tense, the announcer purports to be describing each event coincident with its occurrence. Now we know that, in the strictest sense, the events and their description cannot coincide exactly, owing to the durational and epistemic problems already discussed. I suggest, however, that the conventions of the play-by-play mode of speech include the *fiction* of simultaneous description. We construe the descriptive statements in terms of a virtual viewing arrangement such that the announcer can indeed make them coincide with the profiled events. It just happens that the kinds of events reported have approximately the right duration for the fiction of exact coincidence to seem plausible. Moreover, owing to anticipation as well as the stereotyped nature of sporting events, the time-lag in reporting them may in fact be quite short. The events are actual, but the viewing reflected in their linguistic encoding contains an element of fictivity.

When we turn to other kinds of examples, involving other virtual viewing arrangements, the events themselves have a fictive character. My basic proposal is that the expressions in question relate only indirectly to actuality, even in cases like (19)a, *Our plane leaves at noon*, describing the specific departure of a specific plane. I suggest that what the sentence directly describes is not the actual event *per se*, but rather a *representation* of that event on some kind of *virtual schedule*, some kind of plan or projection concerning the anticipated occurrence and timing of events in future actuality. To support the notion that something like a schedule is involved, we can observe that the 'scheduled future' strongly favors the inclusion of a time expression, and is infelicitous for events not amenable to scheduling or planning:

(22) a *My sister arrives next week.*
b *??My sister arrives.*
c *??An earthquake strikes in a month.*

Moreover, in some instances the speaker may be alluding to an actual schedule, perhaps embodied physically:

(23) *See, there it is on the screen—our plane leaves at noon from gate 74.*

It is nonetheless the virtual schedule, a mental representation of anticipated events and their timing, that is crucial for the scheduled future.

Although a virtual schedule pertains to future actuality, its own status and temporal location are another matter. If a plan is in effect, the schedule itself is stable and mentally accessible through an indefinite span of time that includes the present. The schedule contains *virtual events*, which are representations of anticipated actual events. Moreover, the span of time through which each virtual event is conceived as unfolding is identified with a particular time in future actuality, as shown in Figure 7. But the events *constituting* the schedule are only virtual.

The virtual schedule can be thought of metaphorically as a 'document' available to be 'read' at any time. In producing a sentence like (22)a, the speaker is essentially reading off one of its entries. Reading an entry amounts to the *virtual occurrence* of

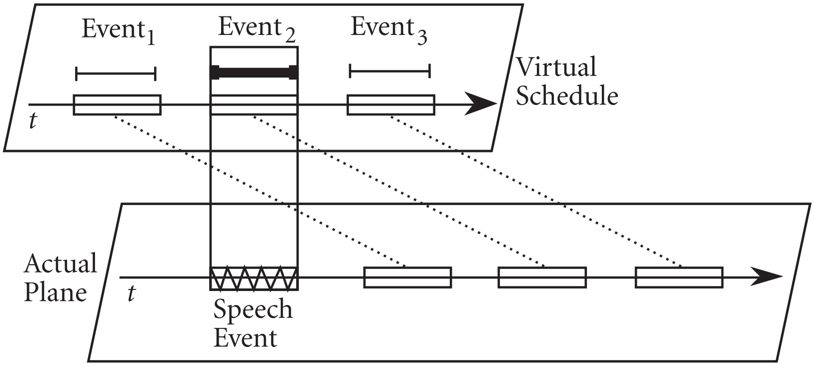

Figure 7.

the event it comprises, and since that event is profiled by the sentence produced, a (virtual) occurrence of the profiled process precisely coincides with the time of speaking. Use of the present tense thus conforms to the characterization in (17), provided that one takes into account the special viewing arrangement in which the speaker is ‘reading’ aloud from a virtual schedule. In that context, where all the events are virtual, they occur in the sense of being read, and the reading is necessarily coincident with the speech event.

Note that the durational and epistemic problems do not arise in this context. The event’s occurrence is only virtual, a matter of the conceptualizer mentally running through it in reading the schedule, so its mental duration can always be made to coincide with the time of speaking. The speaker can also scan the schedule and examine an entry before reading it aloud, thus avoiding the epistemic problem. In fact, the durational and epistemic problems are not intrinsic to present tense or perfectives per se, but can rather be seen as inhering in the default-case viewing arrangement. They arise in the canonical arrangement where the speaker is reporting on real events as they actually occur. In this situation, an event’s duration is the duration of its actual occurrence; it is thus determined by its inherent nature and is usually not subject to speaker control. Likewise, since the speaker is merely reporting, not running the show, he has to observe an event in order to identify and then describe it, hence the epistemic problem. In other viewing arrangements, especially involving the virtual plane, the duration and unpredictability of real-world events may be irrelevant.

A performative does describe a real event with a specific duration, but due to its special properties—identification with the speech event, and the speaker’s intentionality—it inherently avoids the durational and epistemic problems. We can also imagine other viewing arrangements where actual events are being reported as they occur but the problems fail to come up because the speaker controls their choice and duration. Suppose two children are playing with toy cars in a model village.

One child enacts certain events and describes them as she does so. Thus, even though she is pretending, the enactments themselves are actual physical occurrences. In this context the following is perfectly acceptable:

(24) *I drive to work. Now I drive to the store. Now I drive home.*

With each sentence, the girl pushes her car along the path indicated. Each actual event temporally coincides with the speech event describing it. The present tense is applicable because, in this special situation, the speaker knows what event she intends to make happen and controls the duration of its actual occurrence.

I believe that numerous 'special' uses of the present tense in English presuppose non-standard viewing arrangements involving the virtual occurrence of events. This is perhaps most obvious in the case of stage directions, as in (19)b [*Hamlet moves to center stage. He pulls out his dagger. He examines it.*]. Here there is very likely to be a physical document, the play's script, that is literally being read. It is nonetheless the virtual document, comprising a sequence of virtual events, that is crucial. This virtual document is available for reading at any time, and when it is read, each event in turn enjoys a virtual occurrence residing in the reader's apprehension of the sentence describing it. We can even go one step further by observing that an author, in writing a play, is drafting the stage directions for a *virtual reader* (as opposed to any actual one).

What about 'timeless' statements, like (19)c [*A wombat is a marsupial*]? Akin to generics, such expressions are not direct descriptions of actual events or situations. No particular wombat, nor any particular marsupial, is being referred to. Perhaps we can think metaphorically in terms of a document listing supposed eternal truths or scientific findings about the world's general nature (as opposed to specific events occurring within that framework). In any case, we can plausibly regard the profiled relationships as being inscribed on some kind of virtual document describing what the world is like in general. The present tense reflects the virtual reading of inscriptions, hence the virtual occurrence of the designated processes coincident with the time of speaking.

The relationships profiled by such expressions inhabit what I will call the *structural plane*. This term is inspired by Goldsmith and Woisetschlaeger (1982), who distinguish between 'structural' and 'phenomenal' knowledge: '…The "structural/phenomenal" distinction… corresponds to two rather different types of knowledge about the world… One may describe the world in either of two ways: by describing what things happen in the world, or by describing how the world is made that such things may happen in it' (80). Structural knowledge is general knowledge about how the world 'works', whereas phenomenal knowledge pertains to the specifics of what actually happens within that stable framework. Their structural/phenomenal distinction corresponds to the one made here between the structural and actual planes.

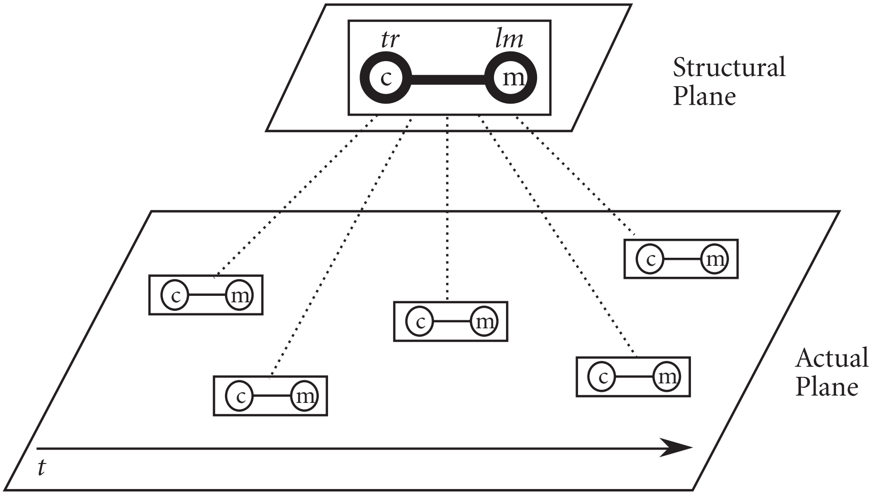

Figure 8.

That brings us to generic expressions, our initial brush with virtuality (recall (3)c). There are various kinds of generic expressions, whose properties are quite significantly different—I am not at all sure they constitute a coherent natural class. Since I have discussed them at some length elsewere (1996b, 1997), I will briefly consider just a single type, namely a singular generic, such as (25):

(25) *A cat plays with a mouse it has caught.*

Obviously, no actual cat is being referred to, nor any actual mouse. The nominals in (25) designate *virtual instances* of the cat and mouse categories, i.e., instances 'conjured up' just for the purpose of making a general statement about the world's structure. (In other works I have used the term *arbitrary instance* for what may be the same notion.) The act of playing with a mouse profiled in (25) is also a virtual instance of that process type. Since the structural plane is a representation of general and stable aspects of the world's structure, a process represented there projects to indefinitely many actual occurrences that instantiate it, involving particular times, places, and participants. This is sketched in Figure 8 (the *landmark*, labeled *lm*, is the participant coded by the object in a relational expression). But what a generic sentence profiles (and thus directly describes) is a virtual event in the structural plane. The profiled process is an entry in a virtual document available to be read at any time. It does pertain to actuality, but only indirectly, via the relationship that the structural plane bears to the actual one.

In effect, the virtual event profiled in Figure 8 functions as a *type specification* capturing what is common to an open-ended set of instantiations in actuality. More

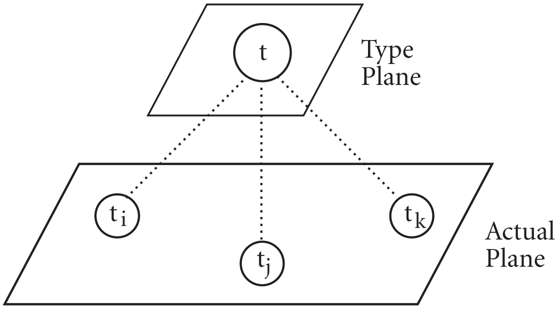

Figure 9.

generally, a *type* (as opposed to an *instance* of a type) is a kind of virtual entity, whether it occupies the structural plane—and thus describes a stable aspect of the world—or is instead created to make a local generalization about what happens within that framework. Although the type/instance distinction is not absolute, and involves numerous subtleties that we cannot explore here (see Langacker 1991:2.2), it should be evident that a type *per se* does not belong to actuality. We can think of a type specification as the abstracted commonality of its instances. As such it lies outside the actual plane, where multiple instances may occur that are distinguished from one another by their spatiotemporal location. Any number of such instances can project to the same type specification, which I will characterize as belonging to a *type plane*, as shown in Figure 9.

When used by itself, without any kind of determiner, a noun stem merely specifies a type. An example is a noun like *cat*, used alone as the first element of a compound such as *cat-lover*. Thus no specific cat is singled out in (26)a, nor is there any indication of how many cats might be involved. In such cases the noun profiles the virtual entity represented in the type plane.

(26) a *Jenny is a* ***cat****-lover.*
b *Jenny loves* ***this cat****.*

On the other hand, a full noun phrase with a determiner profiles an instance of the type specified by the head noun. In (26)b, *this cat* profiles a particular instantiation of *cat* in the actual plane (e.g., t_j in Figure 9). We have seen previously that either actual or virtual entities can be profiled.

Importantly, however, not all instances of a type are actual instances—we also have to posit virtual (or arbitrary) instances. For example, a singular generic like (25), *A cat plays with a mouse it has caught*, designates virtual instances of the *cat* and *mouse* types. As shown in Figure 8, these instances are 'conjured up' as part of an entry in a virtual document describing a facet of the world's structure. Given the purpose of this virtual document, these instances in the structural plane project to an indefinite number of instances in the actual plane. Furthermore, an actual instance of a type can be incorporated as part of some other type description. For example, habitual sentences like (27) are structural statements indirectly describing the multiple instantiation of a process type characterized in terms of specific individuals (*my cat* and *that bird*). Since events in the structural plane are generalizations pertaining to actuality, when appropriate they can incorporate reference to actual individuals.

(27) *My cat stalks that bird every morning.*

It is not generally realized how frequently we refer to types rather than individuals, even in expressions clearly intended as pertaining to actuality. We can see this in the contrast between (28)a and (28)b, which can perfectly well be used to describe precisely same sequence of actual events.

(28) a *Three times, students asked dumb questions.*
b *Three times, a student asked a dumb question.*

They can both be used, for example, if there were exactly three actual events of questioning, each involving a single student (a different one each time) and a single question (also different each time).

The first sentence is a fairly direct description of actuality. It profiles a complex process comprising three actual instances of the process type STUDENT ASK DUMB QUESTION. Since multiple students and multiple questions are involved, the subject and object are plural. By contrast, (28)b is used to describe actuality but refers to it only indirectly. Observe that the clausal portion, *a student asked a dumb question*, occurs with a singular subject and object, even though three students and three questions are assumed to be involved. It therefore does not directly refer to the actual event sequence. Rather, as shown in Figure 10, it profiles the process type A STUDENT ASKED A DUMB QUESTION, which all three actual events instantiate. The student and question are instances of their respective thing types (since they are expressed by full noun phrases, with determiners), but only virtual instances that are conjured up for purposes of specifying a type of process. In effect, therefore, a two-step strategy is employed to convey information about what transpired in the actual plane: the clause itself describes a virtual process, functioning as a type description, and the adverb *three times* specifies its mapping into actuality (how often it was actually instantiated).

A similar constrast is observed in (29):

(29) a *The witnesses all raised their right hands.*
b *The witnesses all raised their right hand.*

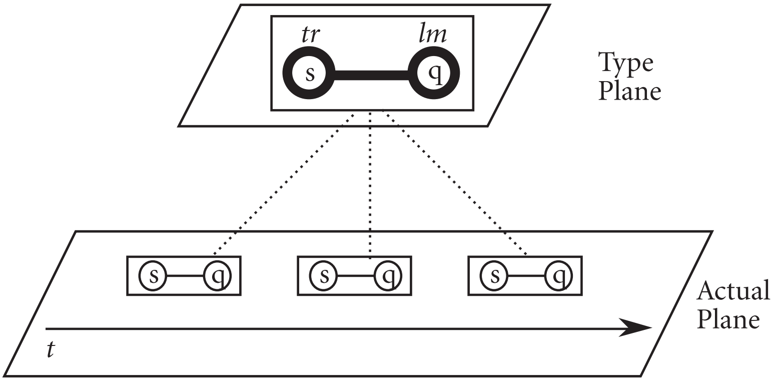

Figure 10.

Both sentences can be interpreted as describing a complex event in which each witness raised his own right hand. Sentence (29)a directly describes this complex event in actuality, in the manner of (28)a. Hence the subject, possessor, and direct object all occur in the plural. The subject and the (coreferential) possessor are also plural in (29)b, but the object is singular (*right hand*), even though multiple hands are involved. I take this as illustrating a little noted but very common situation: it frequently happens that portions of a clause directly describe the actual plane while other portions describe it only indirectly, by naming a type specification instantiated in actuality (these portions can even be intermingled—see Langacker 1996a). In (29)b, most of the clause lexicalizes the complex event in the actual plane, but *right hand* ascends to the type level and codes something common to the component events.

This phenomenon is important for the understanding of quantifiers and quantifier scope. For example, (30)a is ambiguous. It may be the simple, direct description of an actual event in which the three boys collectively lifted a single chair, so that only one instance of lifting occurred. But it could also describe a complex occurrence in which each boy individually lifted a different chair. On this latter interpretation, the predicate encodes the type specification X LIFTED A CHAIR, whereas the subject refers directly to three actual boys, each of whom carries out an instance of that process type. Observe that no specific chair is mentioned—the object nominal *a chair* designates a virtual instance of the category, conjured up just to make a type specification. Though it corresponds to several chairs in actuality, this virtual chair itself is only found in the type plane.

(30) a *The three boys lifted a chair.*
b *Three boys lifted two chairs.*

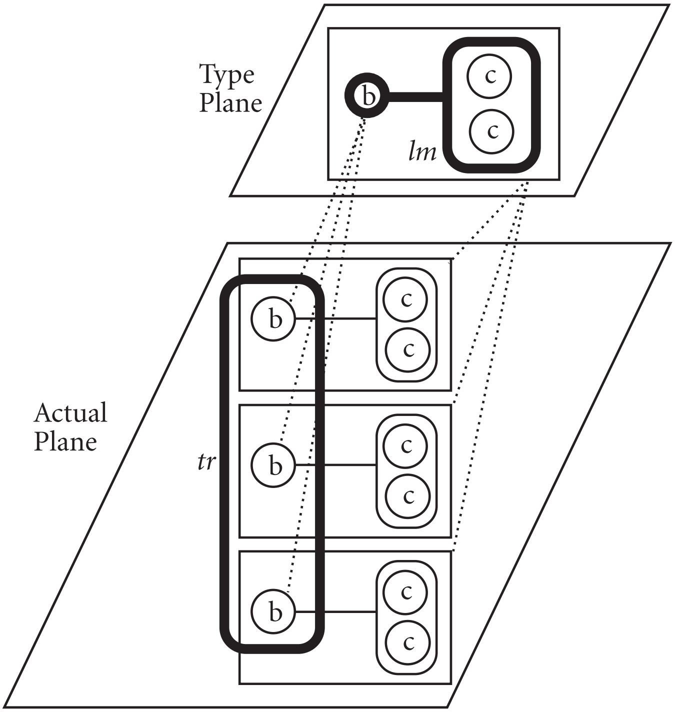

Figure 11.

The characterization of *quantifier scope* is now straightforward. Consider (30)b, on the usual interpretation where *three* has *wide scope* and *two* has *narrow scope*. That is, *three* has *two in its scope*. In terms of our analysis, a quantifier Q_1 has another quantifier Q_2 in its scope when Q_2 is part of a type description ascribed to the set quantified by Q_1 (Langacker 1991:3.3). In (30)b, the quantifier *two* is incorporated as part of the type description BOY LIFTED TWO CHAIRS, and an instance of this process type is ascribed to each member of the set *three boys*.

This analysis is diagrammed in Figure 11. The type plane makes reference to the process type BOY LIFTED TWO CHAIRS. At this level, the boy and the chairs are only virtual—no particular boy is singled out, nor any particular chairs. Three instances of this process type are however found in actuality, as well as three boys, each of whom carries out an instance of the process. Looking at (30)b, we find that different portions of this sentence refer directly to entities found in different planes. The subject *three boys* pertains to actuality: it is only at this level that multiple boys are found. By contrast, the predicate *lifted two chairs* pertains to the type level. It is only at this level that the number of chairs involved is two—in the actual plane, it can be as many as six. Although the sentence does pertain to actual events affecting up to six actual chairs, those events and those chairs are not mentioned directly. They are introduced only indirectly, via a type description and the ascription of an instance of that type to each member of a set of three actual boys.

This has only been a sample of the many kinds of virtual entities encountered in natural language. Once you start looking for fictivity in language, you find it everywhere. *Boundaries* are often virtual, for example, including those that delimit the bounded entities profiled by count nouns (Langacker 1987). There need be nothing at all that objectively delimits the spatial expanse designated by a noun like *region*, *place*, *area*, *location*, *center*, *middle*, or *proximity*. We nonetheless *impose* a boundary to create a *virtually bounded* entity. It might also be suggested that any kind of norm, ideal, or expectation is a virtual entity, and that any departure from it constitutes a *virtual change*. In saying that something is *rough*, *crooked*, *sloping*, *limp*, or *dirty* we implicitly compare it to an imagined counterpart that is *smooth*, *straight*, *level*, *stiff*, or *clean*. Can we reasonably claim that the conception of something sloping, for instance, derives by mental rotation from a fictive situation in which it is level?

At this point I have no definite idea of how far it is useful to push the notion of fictivity. In any case I do not expect to find any clear-cut delimitation. It is more important to work on characterizing each phenomenon in its own terms, with as much precision and detail as possible. We can then hope to isolate an optimal set of descriptive notions, which will make it evident to what extent and in what specific ways the various phenomena are related to one another.

Should we go all the way and say that everything is fictive? Since our entire conceptual world is in some sense a mental construction, should we not just admit that the only kind of reality we have access to is *virtual reality*? I will leave that to philosophers. From the linguistic standpoint, however, the question is not very interesting. Even if we answer in the affirmative, and say that our entire mental world is fictive at some level, it remains true that various aspects of it are fictive in different ways and to different degrees. We still face the problem of sorting all this out, of characterizing the full spectrum of situations: those we naively accept as being real, those we explicitly acknowledge as being imaginary, those involving virtual entities not necessarily recognized as such, and so on.

I want to conclude by emphasizing that cognitive linguists firmly believe in reality, however much they talk about mental constructs and fictive entities. Its basic philosophical stance is *experiential realism* (Lakoff & Johnson 1980; Lakoff 1987), and one of its central notions is *embodiment* (Johnson 1987). There *is* a real world. Unavoidably, we inhabit it. As a species, we have *evolved* to cope with it successfully. As individuals, we *develop* to cope with it successfully. Our existence and interaction with the world is grounded in our bodies. Our brains are physical organs embedded in our bodies, and our minds reside in the activity of our brains. All facets of the mental worlds we construct derive ultimately from our embodied experience as physical creatures in the real world. A primary goal of cognitive linguistics is to spell out the details of how this happens.

I therefore have no intention of denying the existence of reality or the foundational nature of real world experience. It makes no sense to speak of virtual entities except in relation to the actual entities of which they are fictive counterparts. It is nevertheless essential to arrive at an accurate evaluation of the role played by virtual entities in thought and language. I have argued that their role is far more extensive and important than is usually recognized. The view of language stated in (1) is to some extent fictitious and needs to be replaced by a more balanced and realistic assessment.

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PATH DIRECTIONS IN ASL AGREEMENT VERBS ARE PREDICTABLE ON SEMANTIC GROUNDS

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American Sign Language (asl)[1] is articulated with the signer's hands and body in three-dimensional space; like other signed languages, it has evolved to take advantage of human visuospatial abilities. In particular, signers establish locations in the space around themselves ('signing space') to represent important referents in the discourse. asl's normal pronominal and verb agreement systems depend on these locations: pronouns must incorporate the locations of their referents into their articulation patterns, and certain verbs must do so as well.

This use of space in signed languages has received much attention and several different analyses; here, we use the cognitive linguistics framework. We will assume that these 'meaningful' uses of space in signed languages result from conceptual blending (Fauconnier & Turner 1996) of some envisioned 'mental space' (Fauconnier 1985) with signing space. On this view, in establishing referents at particular locations, the signer projects his or her conception of those referents' spatial configuration onto his or her conception of signing space. Classifiers (Liddell 1994), pronouns (Liddell 1990, 1995), and iconic forms in general (Taub 1997) have been treated with variations on approach; the current paper focuses on lexical verbs which incorporate arguments' locations into their movement patterns.

1. Overview of ASL Verbs. It is convenient to divide asl verbs into three groups (Padden 1988). The first type, *plain* verbs, do not change their movement patterns to reflect referents' locations (e.g., love, know, understand).[2] There have been attempts (e.g., Janis 1995) to predict which verbs will be plain, and both semantic and phonological factors seem to be involved; for example, plain verbs are often 'body-anchored' or articulated at a specific location on the signer's body.

Verbs that do incorporate locations are of two types: *spatial* verbs and *agreement* verbs. These two can be distinguished on semantic grounds: spatial verbs are in general verbs of self-motion or caused motion through space, and have source, goal, and theme arguments (e.g., run, walk, move-object); agreement verbs focus more on interactions between entities (e.g., blame, tell, summon, give) and less on precise spatial relationships.

There is also a difference in how spatial and agreement verbs use signing space. For both kinds of verbs, the hand or hands, configured in the verb's specific hand-shape, will move from one meaningful location in signing space to or toward another. But for spatial verbs, the exact spatial path carries more meaning than does the path for agreement verbs (Padden 1988). Spatial verbs start at a location that represents the starting location of some object in a mental space, and end at a location that represents the final location of that object. Small differences in the path's endpoints will be interpreted as differences in the meaning of the verb. On the other hand, agreement verbs start at a location corresponding to one participant in the verb's 'event' and end at a location corresponding to another participant. Small differences in the path's endpoints are not interpreted as significant or meaningful. In cognitivist terms, we might say that spatial verbs employ a more complete topological blending of signing space with a mental space than do agreement verbs.

We can easily envision a semantics-based analysis of spatial verbs that uses mental spaces and conceptual blending: once the signer has set up the conceptual blend of signing space with an envisioned mental space, the verb simply traces the movement of the THEME argument in the blend. But agreement verbs have proved more difficult, on three grounds: their use of signing space is less 'complete', as explained above; they often lack a THEME argument for the verb to track; and their path directions have been difficult to explain. Debate continues (e.g., Poizner et al. 1987; Liddell 1990) as to whether agreement and spatial verbs use space in completely different ways ('grammatical' vs. 'topological'), or whether there is a continuum of uses between the two types. The current paper shows that agreement verbs can indeed be analyzed as tracing paths in their semantics, paving the way for an eventual unified treatment of spatial and agreement verbs (perhaps to be renamed 'blending' verbs).

2. PATH DIRECTIONS OF AGREEMENT VERBS. Most agreement verbs move from their subject's location toward another argument's location (e.g., DEFEAT, GIVE, BLAME), but some move in the opposite direction (e.g., TAKE, QUOTE, BORROW). There have been several attempts to explain this situation. An early analysis based on semantic roles (Friedman 1975) claimed that verbs move from their agent (henceforth, AGT) argument to their patient (PAT) argument, yet verbs like TAKE easily falsify this claim. (Since nearly all ASL verbs with AGT arguments have the AGT as subject, this claim is roughly equivalent to saying that all agreement verbs move away from their subjects.)

The most widely accepted analysis is that of Padden (1988). She simply divided agreement verbs into two morphosyntactic classes: those which move away from their subjects, and those which move toward their subjects (which she called 'backwards'). Each verb's class must be stipulated as part of its lexical representation. This approach, while descriptively adequate, is not explanatory.

In the last twenty years, the field of semantics has developed considerably, both in cognitivist and in formalist approaches; cognitive linguists can now draw on conceptual metaphor theory (Lakoff & Johnson 1980; Lakoff 1992), frame semantics

(Fillmore 1982), mental spaces theory (Fauconnier 1985), and so forth. With these tools, we can craft a successful semantics-based analysis of agreement path directions: namely, that agreement verbs' paths 'follow' the directions of paths in the verbs' semantic frames. That is, once a verb's arguments are established at (or conceptually 'blended' with) particular locations in signing space, the path between the two locations now represents the path between the two arguments; the verb will move between these locations in the direction that corresponds to the path direction in the verb's semantic frame. When the frames contain several paths in opposing directions, a simple set of cognitive principles (*specificity*, *literalness*, and *profiling*; see Table 2) determines which direction is chosen.

3. VERB AGREEMENT DATA. Let us now examine the frames of a number of agreement verbs and compare the results with the verbs' path directions. This will involve descriptions of the specific participants and interactions in each verb's frame, and specifications of some of the (generic) semantic roles assigned to each participant. The roles used in this paper include AGT, PAT, and THEME (see Taub 1997 for a more extensive discussion of semantic roles as they relate to these verbs).

Though our analysis was inspired by the two-path verbs GIVE and TAKE (see section 3.2), we will start with verbs that have only one path and proceed to verbs of higher complexity. All paths are summarized in Table 1.

3.1. VERBS WITH ONE PATH: THE *ACTION-CHAIN* PATH. Many agreement verbs have two arguments with the roles of AGT and PAT; examples include DEFEAT, BEAT, and BOTHER. In these cases, the verb moves from the AGT argument's location to the PAT argument's location. The frames of these verbs generally have no physical object literally moving from one place to another. They do, however, have a *metaphorical* object 'passing' from one participant to the other.

Work on conceptual metaphor (e.g., Lakoff & Johnson 1980; Lakoff 1992) has shown that we often conceptualize an abstract or complex domain of thought by using what we know about another, more concrete domain. One example of this is the abstract domain of cause and effect—we often conceptualize *causing* as *giving an object*: we think of the *effect* as an *object*, and we think of *being affected* as *receiving* the object. This particular metaphor has been found in the conventional resources of many languages (cf. Lakoff 1992; Taub, in press); examples from English include *The noise gave me a headache*, *I got a headache from the noise*, *The soup owes its flavor to the spices*, and so on. In these cases, the effect is conceptualized as a metaphorical object that moves from causer to affected one—or, in terms of semantic roles, from AGT to PAT.

This metaphorical conceptualization is available in ASL as well. Whenever a verb has AGT and PAT arguments, the *causing* as *giving* metaphor can be invoked to set up a path from AGT to PAT. (This amounts to claiming that the AGT schema includes a path outward from the AGT.) Notice that this path is 'generic': it depends not on the specific details of the verb's frame, but only on the conceptualization of one entity as affecting another entity. I will refer to this path as the *action-chain* path, since various accounts have called the 'path of effects' the action chain (e.g., Langacker 1991; Croft 1991). When no other, more frame-specific path is available, the agreement verb will follow the action-chain path.[3]

As an illustration, consider the verb DEFEAT (Figure 1).[4] In this verb's frame, there is some contest or struggle between two entities. One entity, the 'victor', succeeds in ending the struggle and more-or-less permanently placing the other entity (or 'loser') in a less powerful position. DEFEAT conceptualizes the victor as AGT and the loser as PAT, and so the action-chain path leads from victor to loser. This is indeed the direction of DEFEAT's movement.

3.2. VERBS WITH TWO PATHS: THE IMPORTANCE OF *SPECIFICITY*. Let us now consider verbs which have two paths in their semantic frames: the action-chain path and one other. We will start to see the importance of specificity, or connection to a particular frame and its details, as a deciding factor when paths conflict.

The verbs GIVE (Figure 2) and TAKE (Figure 3) both have in their semantic frames a physical object which moves from one participant ('original owner') to the other ('new owner'); they differ in which participant is construed as actively causing the transfer. For GIVE, the original owner is the active party or AGT; thus, both the action-chain path out from the AGT and the literal path from original to new owner lead in the same direction.[5] There is no conflict, and the verb moves as one would expect, from AGT's location to PAT's location.

For TAKE, the new owner is construed as the AGT; thus, the action-chain path out from the AGT and the literal path from original to new owner lead in opposite directions. The verb form itself in fact moves from original to new owner, just as GIVE does. We may conclude from this that when a frame-specific literal path conflicts with the generic action-chain path, the frame-specific literal path 'wins'.

A similar pair of examples demonstrate what happens when a frame-specific *metaphorical* path is pitted against the action-chain path. Our examples are the verbs INFORM (Figure 4) and QUOTE (Figure 5).

Both of these verbs draw on a widespread metaphorical understanding of *communication* as *sending objects* from person to person. In this metaphor (Reddy 1979; Sweetser 1987), *ideas* or *messages* are seen as *objects*, *expressing* an idea is seen as *sending* the object, and *understanding* an expressed idea is seen as *catching* the object. Wilcox (1993) and Taub (1997) give extensive independent evidence for the existence of this metaphor in ASL.

The frame of INFORM has two participants plus an idea or message. The first participant ('informer'), who is construed as the AGT, expresses the idea with the intent that the second participant ('learner') should understand it. The action-chain path out from the AGT and the metaphorical path of the idea thus both lead in the same

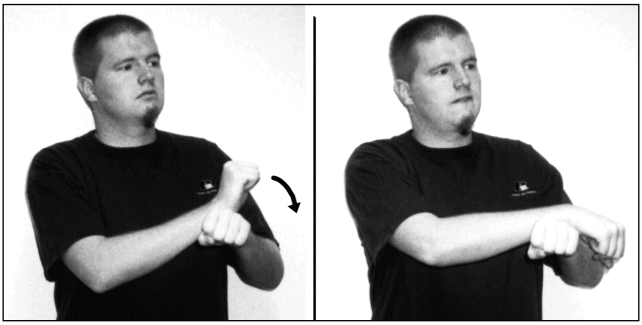

Figure 1. I-DEFEAT-HIM-HER-IT.

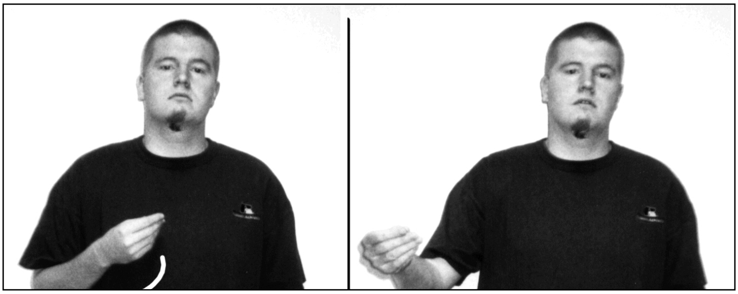

Figure 2. I-GIVE(TO)-HIM/HER/IT.

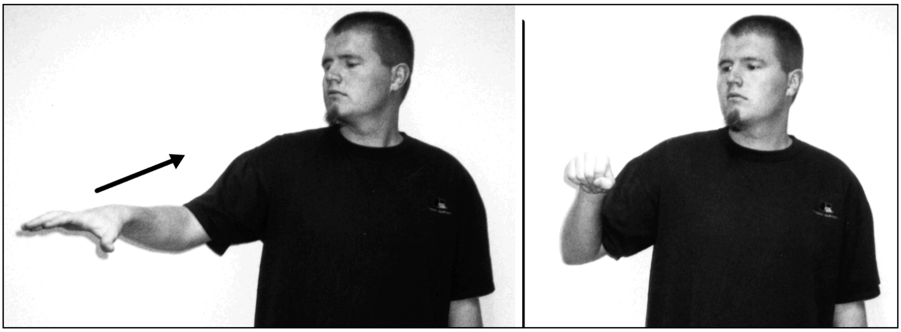

Figure 3. I-TAKE(FROM)-HIM/HER/IT.

direction: from informer to learner. It should be no surprise that the verb moves in this direction as well, from informer's location to learner's location.

For QUOTE, on the other hand, just as for TAKE, there is a conflict between paths. In this verb's frame, one participant ('quoter') re-uses an idea or message developed by the other participant ('originator'). The idea thus metaphorically travels from the originator to the quoter. The quoter, however, is construed as the active party; and therefore the action-chain path leads from quoter to originator. As we can see from Table 1, QUOTE in fact moves from originator's location to quoter's location. We can conclude, then, that when a frame-specific path, be it literal or metaphorical, comes into conflict with the generic action-chain path, the frame-specific path is selected.

3.3. VERBS WITH THREE PATHS: THE IMPORTANCE OF *PROFILING* AND *LITERALNESS*.

Up to now, our verbs' paths have differed in their specificity to a particular frame; we have also seen examples of literal and metaphorical paths. Verbs with three paths in their frames often add the third factor mentioned above: degree of *profiling* (e.g., Langacker 1987). Simply put, a verb can focus attention on or 'profile' a particular path while leaving other paths as part of general background knowledge.

There are a large number of logically possible combinations of three paths that can be either literal or metaphorical, frame-specific or generic, and profiled or backgrounded. ASL does not exhibit all of these possibilities (many of which, though logically possible, would be semantically impossible—e.g., three backgrounded paths). In fact, three verbs are all that we need to figure out how these factors interact in ASL.

Let us consider the verbs BORROW (Figure 6), ASK (Figure 7), and INVITE (Figure 8). In the frame of BORROW, there are two participants and an object. One participant is the owner of the object. The second participant ('user') takes the object from the owner, uses it for some time, and then gives it to the owner again. The verb BORROW construes the user as AGT, and profiles the user's taking (and perhaps using) of the object. If a signer were to use the verb BORROW, she or he would be asserting that some user had taken some object from its owner, and that both parties intend for the object to be returned; she or he would not be asserting that the return had actually taken place.

There are three paths in this frame: the profiled literal path of the object from owner to user; the backgrounded literal path of the object from user to owner; and the action-chain path leading away from the AGT/user (see Table 1). Note that the second and third paths are in the same direction. Nevertheless, BORROW follows the first path, from owner's location to user's location. This tells us that if there is a conflict between two literal paths, the profiled path 'wins'; moreover, the two 'weaker' paths cannot pool their motivations and 'overwhelm' the profiled path.

Our second three-path example is ASK. In the frame of *asking*, there are again two participants. The first, or 'asker', wishes to know some information. The asker

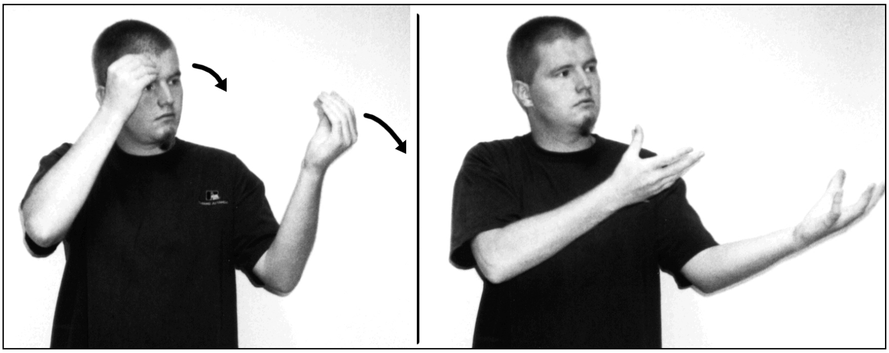

Figure 4. I-INFORM-HIM/HER/IT.

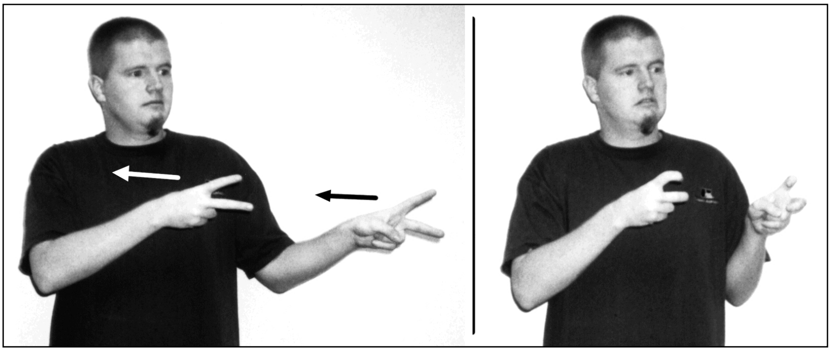

Figure 5. I-QUOTE-HIM-HER-IT.

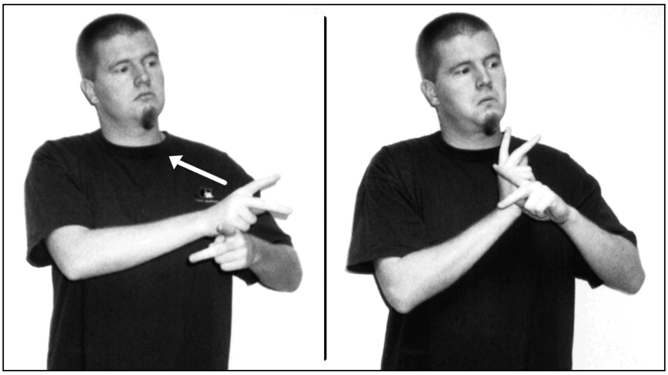

Figure 6. I-BORROW(FROM)-HIM/HER/IT.

sends a message to the second person or 'answerer'; on receiving this message, typically the answerer would respond by telling the asker the information which he or she wished to know. The verb ASK profiles the first linguistic interaction and leaves the second as background; the asker is construed as the active party.

The paths in ASK's frame are as follows: the profiled metaphorical path of a message from asker to answerer; the backgrounded metaphorical path of another message from answerer to asker; and the action-chain path out from the AGT/asker. In this case, the profiled metaphorical path and the action-chain path are aligned together. As we might expect, the verb itself follows these two and moves from asker's location to answerer's location; no new information is gained here but our hypotheses are not disconfirmed. (The verb ANSWER, which uses the same frame, but profiles the second interaction and construes the answerer as AGT, predictably moves from answerer to asker.)

INVITE does provide significant new information. In INVITE's frame, there are two participants ('host' and 'guest'); prototypically, the two are in different locations. The host directs a message to the guest stating that his or her presence with the host (usually at some event) would be welcome; the guest is then free to decide whether to join the host or not. INVITE profiles the initial message and backgrounds the guest's expected response; it construes the host as AGT. Thus, this verb has three paths: the profiled metaphorical path of the linguistic message from host to guest; the backgrounded literal path that the guest would take to the host; and the action-chain path from host to guest.

Note that for this example the two frame-specific paths, which lead in opposite directions, are of different types: the profiled path is metaphorical and the backgrounded path is literal. From our previous two examples, we might expect that a profiled path would be selected over a backgrounded path. Yet INVITE actually moves from guest's location to host's location: it follows the backgrounded literal path rather than the profiled metaphorical path. We see from this example (and from others such as SUMMON which share this pattern) that literalness is a more important criterion for ASL agreement verbs than profiling.

3.4. VERBS WITH COMPLETELY BALANCED PATHS: DOUBLE REPRESENTATION. I will conclude by examining some less-typical agreement verbs; these include EXCHANGE, COMMUNICATE, DISCUSS, and NEGOTIATE. These verbs tend to have dual or multiple subjects, rather than a subject and an object or oblique argument. Their frames have two or more paths which are basically identical. Though EXCHANGE's paths are literal and the other examples' are metaphorical, their influence on the verbs' movements are equivalent; let us then focus on DISCUSS (Figure 9).

The frame of DISCUSS involves at least two participants ('discussants') exchanging ideas with each other; metaphorically, this corresponds to objects traveling back and forth between the discussants. The verb does not single out one person to con-

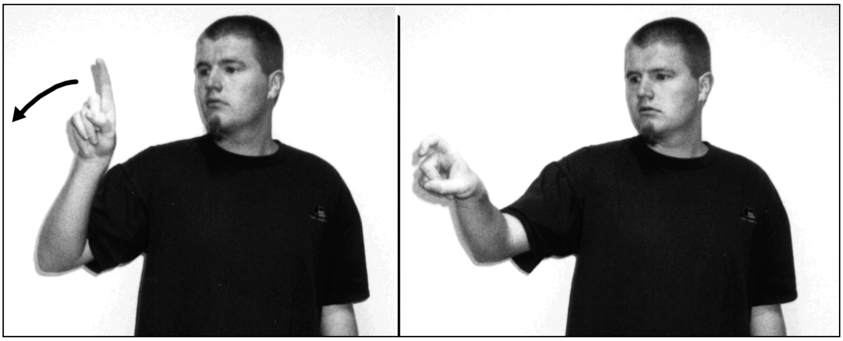

Figure 7. I-ASK-HIM/HER/IT.

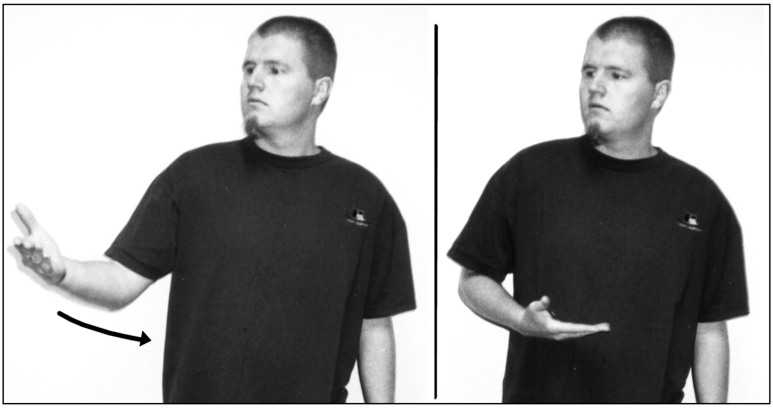

Figure 8. I-INVITE-HIM/HER/IT.

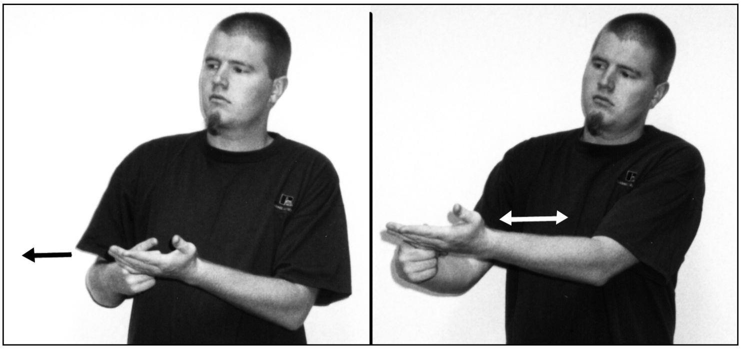

Figure 9. WE-TWO-DISCUSS.

strue as AGT, so there is no action-chain path; nor does it profile one object's path or one discussant's contribution.

None of the criteria identified in the above analyses helps us in identifying a path direction for the verb to follow; indeed, it is not clear that any criterion could do so. It would not come as a surprise to learn, then, that the forms of these verbs typically incorporate two or more paths. For example, the form of DISCUSS with a dual subject moves back and forth between the two discussants' locations. Each of the verbs listed above has its own idiosyncratic pattern for incorporating multiple paths; there is not really a system for these verbs as there is for the other examples, but their patterns fit well with the frame-semantic analysis proposed here.

4. THE MODEL. Our survey of the ASL verb agreement path data is now complete; Table 1 gives a summary of the verbs and their directions.[6]

We can account for these paths with the model proposed in Tables 2 and 3. This model consists of rankings based on the three criteria we have used, and a procedure that selects the correct path when the rankings conflict with each other. The criterion of *specificity* (as we have seen) lets us rank frame-specific literal or metaphorical paths over the generic action-chain path; *literalness* ranks paths involving movement of a physical object over all others; and *profiling* ranks profiled paths over backgrounded paths. In general, the paths which are more cognitively basic and the paths which have more attention drawn to them are the paths which are selected.

There are times, however, when these rankings conflict (as in the case of INVITE). The procedure in Table 3 accurately generates the verb path directions listed in Table 1. Rule 1 is sufficient to determine the path direction for one-path verbs like DEFEAT. For GIVE, TAKE, INFORM, and QUOTE, with an action-chain path and one frame-specific path, Rule 2 gives the correct direction. INVITE has two frame-specific paths, one of which is literal; Rule 3 resolves the conflict by selecting the literal path. ASK and BORROW both have two frame-specific paths of equal literalness; for them, Rule 4 correctly selects the profiled paths. Finally, for verbs such as DISCUSS with completely balanced paths, Rule 5 allows for multiple path representation.

5. DISCUSSION. Like Langacker 1987, I feel that a good grammar of a language should not include rules; elements of the grammar should either be actual forms of the language or 'schemas' that generalize over forms of the language. The model in Tables 2 and 3 does not fit my standards of a good grammatical model. We can regard it, however, as a sort of shorthand for a full cognitive model which has not yet been worked out. The rule systems and hierarchies are useful in that they do accurately describe the facts of the language; but it is unlikely that they actually 'exist' within an ASL user's grammar. I do not believe, for example, that language users go through a series of ordered rules to derive correct linguistic structures.

gloss	paths	‘winner’
DEFEAT	→ action-chain	→ action-chain
GIVE	→ action-chain → literal	→ action-chain and literal
TAKE	→ action-chain ← literal	← literal
INFORM	→ action-chain → metaphorical	→ action-chain and metaphorical
QUOTE	→ action-chain ← metaphorical	← metaphorical
BORROW	→ action-chain ← literal profiled → literal backgrounded	← literal profiled
ASK	→ action-chain → metaphorical profiled ← metaphorical backgrounded	→ action-chain and metaphorical profiled
INVITE	→ action-chain → metaphorical profiled ← literal backgrounded	← literal backgrounded
DISCUSS	→ metaphorical profiled → metaphorical profiled	↔ both directions

Table 1. Agreement verbs and their path directions.

It is heartening to see, however, as we look at the model in Tables 2 and 3, that the rankings and rules are well motivated on semantic grounds. They are not unreasonable or arbitrary, and clearly will lend themselves well to a cognitive-grammar-style analysis. We might expect the rankings, in particular, to be linguistic universals; but the conflict-resolution procedure seems less motivated by cognitive processes. For example, it is possible to imagine a signed language where profiling ‘wins’ over literalness, and the verb meaning *invite* moves from host to guest. This is not a problem for motivation-based linguistic theories; when two opposite choices have equal (and different) motivations, this is an area where we predict cross-linguistic variation (cf. Croft 1990).

It should be easy to extend this path-based analysis to include spatial verbs, since these too trace out the path of an object in their semantic frames. Indeed, we should

Rankings	
Specificity:	[literal, metaphorical] → action-chain
Literalness:	literal → [metaphorical, action-chain]
Profiling:	profiled → backgrounded

Table 2. Path rankings.

Rules (in order)
1. Choose a path in the verb's semantic frame.
2. If there is a tie, choose the most specific path.
3. If there is a tie, choose the most literal path.
4. If there is a tie, choose the most profiled path.
5. If there is a tie, represent both paths.

Table 3. Path selection procedure.

be able to predict on semantic grounds whether a verb will manifest as a spatial verb or as an agreement verb. As Janis (1995) noticed, often one verb root will have both spatial and agreement forms depending on what meaning is conveyed. This suggests that semantic considerations are important in the formal realization of these verbs, and that the more a verb's semantics involves precise spatial locations, the more fine-grained will be its use of signing space.

6. CONCLUSION. We have seen that the path directions of ASL agreement verbs are predictable from their semantics. Specifically, agreement verbs's semantic frames contain paths, and the verbs trace out analogues of those paths in signing space. When a verb's frame contains paths in opposing directions, we can decide on principled grounds which of those paths the verb will follow. Although such an approach might not have been successful in the past, the study of cognitive semantics has advanced to the point where we can draw on the semantics of language to predict substantial generalizations in linguistic patterning.

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[1] This paper is condensed from Taub 1997:276–341. My thanks to George Lakoff, Eve Sweetser, Dan Slobin, and Scott Liddell for comments, and to Tim Gough for modeling ASL examples.

[2] As there is no compact and universally-accepted phonetic notation system for ASL, I will follow the usual convention of employing English glosses in SMALL CAPS to represent ASL signs.

[3] Taub 1997 contains extensive discussion of the action-chain path, including evidence that it can lead from AGT to GOAL/RECIPIENT and SOURCE arguments as well as to

PAT arguments. In the current paper it will often be described as 'leading away from AGT'.

[4] All verbs are illustrated incorporating a first-person subject and third-person object or oblique argument.

[5] In this paper 'literal path' means the path traced by a physical object.

[6] Some additional classes of verbs, including those with STIMULUS and EXPERIENCER arguments, are discussed in Taub 1997; space does not permit their inclusion here.

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TEMPORAL BINDING AND THE STRUCTURE OF RELATIONS

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The present paper represents an outline and discussion of some of the essential ideas that have guided the construction of a Neurocognitve Linguistic (Lamb 1999) pure connectionist network model, the more specific details of which are to be spelt out in a paper currently in preparation. Here we will first consider the problem of propositional binding, and the specific context within which this problem pertains; we will then present the central ideas that are guiding the current work, particularly that of temporal binding; and finish with the unexpected conclusion that relational concepts will be represented as sets of single-place predicates.

1. The Problem. The problem is easily stated. When the cognitive system of an English speaker encounters a simple clause such as 'The dog bit the man', or 'Mary sent her Dad a letter', how does it know (i.e., how does the listener know) who did what to whom? For anyone with any language training, the answer seems totally (and uninterestingly) obvious: word order! The canonical svo word order of English allows us to determine who is the subject, who is the object, etc. But while that is certainly true, from the current standpoint, it is only half of the answer. Neurocognitive Linguistics is not so much concerned with abstract grammatical analyses as it is with the possible structure and characteristics of the cognitive system itself. Certainly in the case of so-called grammatical word order languages (those, like English, where word order determines grammatical role), word order is the critical determinant that the listener's cognitive system must be employing in its conceptual interpretation of the linguistic string, but the interesting question is precisely *how* does it do this? What is the nature of the system that can respond to word order, and result ultimately in comprehension? That is the question that is before us here. In addressing this question, the focus will be on the specific mechanism that mediates between the points of perception and comprehension, but we will first have to briefly consider these endpoints themselves, particularly that of comprehension.

2. The Context. What we are setting out to do here is ultimately to construct a model of the specific mechanism responsible for the conversion of simple linear linguistic inputs (sv, svo, and svoo structures) into conceptual *images* (see below

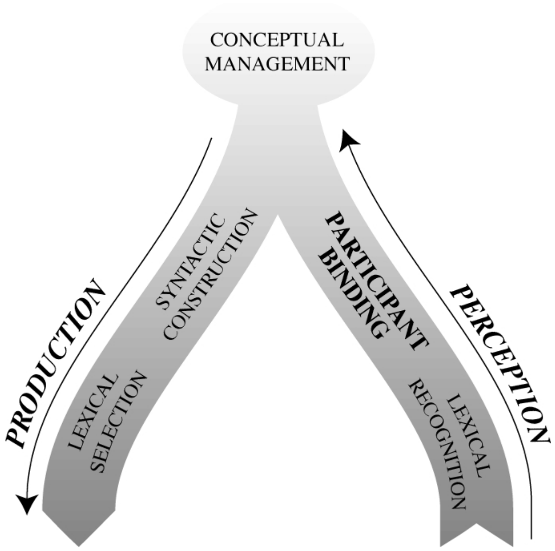

Figure 1. 'Participant binding' within the generalized flow of linguistic processing.

for a clarification of this term). In order to characterize the important elements of that process, let us divide up an act of linguistic perception into three steps: lexical recognition, participant binding, and conceptual management (Figure 1). These steps are gross, and conceal a great deal of internal complexity. As it is the middle step (heavy type in Figure 1) that is of interest here, I will quickly comment on the other two, before leaving them to focus on the main issue of participant binding.

2.1 Lexical recognition. The framework of Neurocognitive Linguistics (Lamb 1999) has a lot to say about the initial stages of linguistic processing that have been lumped together here under the heading 'lexical recognition'. Of course, that term itself has been used elsewhere in the literature, and it is used here at the risk of misleading the reader. It was chosen, however, because the processes ranging from phononic perception (the lowest level of linguistic input processing) up to the level of lexemic recognition proper, represent together the interaction of the more stable, learnt units in linguistic structure, and as lexemic recognition represents the top end of that flow, it was chosen as a cover-all term. The kinds of relationships necessary for the appropriate and systematic recognition of known linguistic elements is articulated in detail in Lamb (ibid), and need not occupy our attention here.

2.2 Conceptual management. The view of cognitive processing adopted herein is one that is committed to the notion of mental imagery (Kosslyn 1994; Kosslyn &

Koenig 1992). Although the debate between mental imagists and those who prefer to think of cognitive processes in terms of analog computer metaphors (see Block 1990; Sterelny 1990) may go on, Kosslyn's excellent 1994 publication represents a sufficiently definitive statement of the nature and viability of mental imagery that I take the issue, as the title of Kosslyn's work suggests, to be resolved. Here is not the place to reiterate the conception of *imagery* to be found in Kosslyn's work, but it should be made clear that this is not an appeal exclusively to visual imagery. A mental image, or *concept*, can be understood as any constellation of neural activity (unimodal or cross-modal) that is upstream from perceptual inputs proper, and that can be experienced as a coherent mental construct (a thought, an idea, a belief, an understanding, a memory, etc.).

These two end-points have been well and meticulously studied, but few researchers, if any, have addressed the question of the essential translation step that I suggest intervenes between these levels, and which I am going to call *participant binding*. So, let us begin the discussion of particular guiding notions by outlining why such a step is necessary at all.

3. Some Guiding Notions.

3.1 Why do we need the participant binding step? An image assembled from *perceptual* input (we will not consider linguistic input just yet) is lent cohesion by the fact of its spatio-temporal contiguity in the real world. The image hangs together as a cohesive percept by virtue of the fact that it impinges on the perceptual apparatus, and is passed on into the cognitive system with the same internal cohesion (internal to the image that is) as the stimulus exhibited in the world. This is a dramatic oversimplification of an extremely complex process, but the crucial point here—and one which I wish to emphasize strongly—is that the cognitive cohesion of a sensory percept results directly from its real-world cohesion.

In the case of recall, a similar phenomenon can be envisaged. There is a growing body of evidence to support the idea that recall of mental imagery employs the same regions of brain structure (and hence by implication, the same mechanisms) as the processing of a perceptual input stream (extensive reviews are in print: from the realm of behavioral studies—Finke 1985, 1986, 1989, 1990; Finke & Shepard 1986; Shepard & Cooper 1982; Hampson & Morris 1990; from neurophysiological studies—Farah 1988; Kosslyn & Koenig 1994). When considering the re-evocation of a mental image (for instance, the image of a visual scene), the highest organizing element—the structure ('memory trace', 'engram') that engenders the reactivation of that image—must itself be highly *local*, either spatially, or else temporally in that its component structures will be tightly internally yoked, making its own activation closely cohesive. The re-evocation of a percept via recall mechanisms can thus also be understood as being engendered and controlled by a (spatio-) temporally local source, just as its original perception was, despite the fact that these alternate sources are phenomenologically very different.[1] The internal cohesion of the recalled image is hence governed by a qualitatively similar phenomenon to that of the original percept—a source signal which itself exhibits the right kind of structure.

But significantly, the auditory comprehension of a *linguistic* string is not like this at all. Linguistic strings are linear, constrained by their acoustic manifestation, and as such involve the systematic distortion of that which they represent. Conceptual elements are artificially separated into lexemic chunks and delivered in an order which is not directly iconic to the real world event. Consider an event which might be described by saying 'The dog is biting the man'. In witnessing this event in the world, we see two objects (*the dog*, *the man*), involved in a particular kind of interaction (*is biting*). It would be most likely that this image would come to our attention all at once, such that there is no sense in which we perceive first the dog, then the action it is involved in, and then the man.[2] The English linguistic code, however, requires quite a significant distortion of such a perceived scene. It requires us not just to name the two physical entities involved, but also to separate out the relationship between them and to represent it too as a separate lexeme, making *three* linguistic entities (ignoring articles and verbal periphrasis) where there are only two entities in the real world event. The relationship specified by the verb is clearly not a *thing* in the world. It is a set of specifications that apply differentially to all of its core participants (about which, more below). In addition to adding an extra apparent entity (the verb) to the description, the linguistic code also arranges these entities in a linear sequence, quite out of keeping with the simultaneity of the event they are describing (at least in the case of the example we are considering). The linguistic string thus represents at least a two-way distortion of the real scene: it has added an entity, and it has flattened a simultaneous event into a linear sequence. Given the isomorphism of mental imagery to real event structure as just outlined, it becomes evident that this distortion must be *undone* in order for the string to end up as an appropriate mental image.

As a brief aside, given the comparable perceptual characteristics of all humans, this mandatory distortion of multidimensional perceived event structures for expression in linear (in a sense monodimensional) linguistic form, can be seen as the phenomenon whose consequence is the potential for syntactic variation. The ways in which this distortion can be achieved are only weakly constrained, and within these constraints all possible variation is to be expected. It is here that models such as the Langacker's action chains come into play, as this range of possibility is collapsed in particular languages in congruence with dominant metaphorical mappings. Were no such distortion mandated by the linguistic system (i.e., if language were directly iconic to perception), there should be little reason for human languages to exhibit the wide syntactic variation that they do. We would still expect *lexical* variation on purely probabilistic grounds, but core syntax would be directly determined by the structure of mental images, congruent with perceptual inputs, and assuming comparable perceptual processing as a species-wide phenomenon,

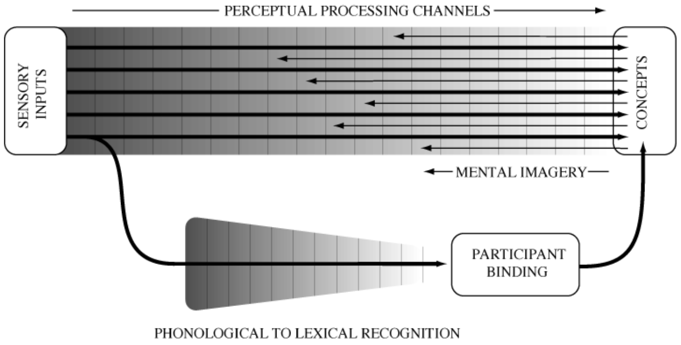
PERCEPTUAL PROCESSING CHANNELS
SENSORY INPUTS
CONCEPTS
MENTAL IMAGERY
PARTICIPANT BINDING
PHONOLOGICAL TO LEXICAL RECOGNITION

Fig. 2. The 'sidetrack' of (auditory) linguistic perception against the mainstream of perceptual input processing.

then syntax too—at least for perceivable real world events—would be stable across the species.

So, the encoding and expression of a perceptual image in linguistic form adds a layer of encryption which must be removed in order for the interlocutor to (re)construct the intended image (Figure 2). It is this decryption process, at a very basic level, that is the translation step referred to above as 'participant binding'. Let us now characterize the process itself in a little more detail.

3.2. WHAT IS 'PARTICIPANT BINDING'? In witnessing the dog biting the man, we see two entities behaving in particular ways. The sum total of their combined behaviour equates with the event 'is biting'. In order for the interlocutor to reconstruct both the participants and their respective behaviors from a linguistic report of the same event, the participants' identities (the noun phrases in the input string) must be faithfully bound with the respective behavioral specifications of the relational predication (the verbal complex). It is this process that Cognitive Grammar (Langacker 1987, 1991), for instance, represents using integration lines between the profile diagrams of participant THINGS and open E-SITES in RELATIONAL profiles.

That is, as comprehending the target event involves rebuilding a cohesive mental image, a prerequisite for which is that the 'uninvolved' nominal images (extracted from the NPS alone, which give no specific information about their involvement with each other) must be given the appropriate 'directions' (in the sense of stage directions) in order to allow them to play the appropriate role in the overall image. I will call this combination of nominal + relational specification a 'performer'. The directions for performers are specified by the relation (the verb): the single verb is the source of the performance data for all of its core participants. This means that each participant of a multivalent relation will receive a distinct semantic specification from the same verb, or in other words, the 'participant binding' mechanism will be responsible for grouping the nominal arguments with the particular aspects of the verbal semantics relevant to their particular role. Note that the two participants in the relation 'bite' are not doing the same things—they have different performances defined by the relation. This notion holds the implication that relational lexemes will evoke a set of related semantic arrays, one for to each participant, and that the co-ordination of each specific array with the incidental participant nominal that is performing it results in the contribution of performer images to the overall composite mental image. Relational lexemes, in this view, will be represented in the cognitive system by node sets that have the same number of separately accessible arrays as they have core participants. We will return to this notion below. First, let us turn our attention to the question of 'binding' itself.

3.3. How does one 'bind'? I have been speaking of a process that I have not yet defined, called *binding*. Binding is essentially a question of establishing *what goes with* what—e.g., which nominal fills which relational role (for instance). How might the cognitive system actually do this? One obvious way is to invoke some system of indexing that symbolically tags each conceptual element such that its incidental affiliation is worn on its shoulder (as it were). The Spreading Activation model of Dell (1986), for instance, has this characteristic. In a system such as this, inputs are categorized on the basis of the overt grammatical indicators of their case roles (i.e., word order, case marking…) and are tagged (subject, object, etc.) such that as they come into combination in higher order structures, their relative involvement is encapsulated in the conceptual constellation that comprises them. There are two principal reasons why such a solution is rejected here.

The first reason is that the introduction of any such tagging system actually creates an endless regression—a 'hall of mirrors'—in that it requires the existence of a microstructure *internal* to the tagging mechanism that has all the characteristics of the macrostructure that it is meant to account for. The mechanisms that recognize and tag targets would themselves have to have some way of binding the symbolic tags to the inputs to which they are responding. One therefore has a binding mechanism within the binding mechanism. How would we account for the operation of this internal binding system? Having yet another binding mechanism inside is clearly getting us nowhere, but if the *internal* structure of the binding module is to be characterized using a different approach, then why not employ that approach (whatever it might be) right from the outset to describe the cognitive system directly?

A more pressing problem with a symbolic tagging model, which in fact leads to the first problem just discussed, is that it rests on an implausible interpretation of neural communication. For symbolic tags to be moved around the system, the elements of that system would need to be capable of engaging in complex information transmission. A 'tag' is a complex chunk of information, and the implication of a symbolic tagging model is that such a chunk of information gets somehow added to the activation pattern, and moves around with it, to be subsequently read and acted on by some other part of the system. In the pure connectionist conception of neural activity taken here (Lamb 1999), such complex information transmission does not occur. There are only 3 degrees of freedom for the output of individual neurons (intensity, duration and periodicity) which are simply not enough for them to engage in symbolic transmission. Allowing global (spatio-temporal) patterns of activity to define a fourth degree of freedom (i.e., to allow that whole patterns of activation can represent symbols, see for instance Burnod 1991; Eckhorn 1993) increases the possibilities of informational complexity, but with a devastating effect on robustness—patterns of activity in neural systems are evanescent, and cannot remain spatio-temporally consistent in any way that would be sufficient to the task of reliable complex information transmission from point to point. While it is certainly true that the precise nature of neuronal communication is not yet entirely clear, nevertheless the weight of evidence to date suggests that neural systems do not engage in complex information transmission in the manner of a neural 'internet'. Neurons are not little phone lines, transmitting analog signals that are decoded and read by other neurons. In the pure connectionist conception, complex information is an emergent characteristic of the shape and incidental activation characteristics of the network itself. The 'informational content' of any one node is determined solely by its specific connectivity within a larger structure (Kandel et al. 1991). Information is not *passed through* such a system in any real sense, except perhaps insofar as the basic activation signal itself can be thought of as a (very simple) informational event. The symbolic tagging approach is mentioned here because it is one that is commonly found in the literature. There is however a far more elegant and plausible solution, also evident in many current models (notably that of Shastri & Ajjanagadde 1993, which served as a major inspiration for the current work), and that is to use temporal synchrony.

In a temporal solution, binding is achieved not by chunks of code, but rather by ensuring *synchronous* activation. That is, for a nominal and its performance specification (for instance) to be bound together as part of the same performer *concept*, what is required is to ensure that they become active *at the same time*. Such an idea not only avoids the undesirable aspects of a symbolic approach, but has one further advantage in that it has a very naturalistic probable source (in evolutionary terms).

That which contributes most directly to the *perception* of unity in the environment is contiguity in space and *time* of the event that triggers the percept. You see a child holding a balloon, suddenly the balloon seems to vanish, there is a loud pop, and the child starts crying. The real-world simultaneity of these three events strongly biases us towards perceiving them as intrinsically related—as elements of a single event. I recall a scene from the movie *Indiana Jones and the Last Crusade*, where the hero is attempting to break the floor tiles in a library using a heavy metal stand. At the same time, a librarian is stamping books. By chance, the stamping action of the librarian coincides repeatedly with the loud report made by the hero's slamming the metal stand into the floor, and in a wonderful demonstration of precisely the point being made here, the librarian's eyes widen, and he looks perplexed at his stamp, trying to ascertain how it could possibly have made such a loud noise!

It seems totally unremarkable that this feature of real-world event cohesion (i.e., spatio-temporal contiguity) should be reflected in the development of a cognitive system that can perceive, comprehend and reconstruct such phenomenology. It would indeed be altogether more surprising if our cognitive system overlooked this phenomenon entirely, and went to all the trouble of symbolic coding, when it appears that comparatively simple-minded iconic synchrony will do a lot of the work for us (perhaps all of it). Bear in mind that we are talking about structure at a very specific level. How the internal cohesion of a composite mental image is maintained at higher processing levels is not an issue I wish to consider here.[3] The temporal solution to binding offered here is specifically intended to untangle the distorted semantic specifications of a linguistic string, and pass the resorted results on to higher level processing areas in a form more consistent with their real-world images. What the binding mechanism is doing is hence assuring synchrony between the activation of local nodes that themselves feed on to higher-order semantic arrays. This notion has an interesting consequence for the cognitive representation of relations at this level, which was hinted at above, and to which we now return.

4. A CONSEQUENCE OF THE TEMPORAL SOLUTION—THE STRUCTURE OF RELATIONS. Having decided to treat temporal synchrony as the determinant of conceptual unity, we are at once faced with a difficulty. Consider again our example from above 'The dog is biting the man'. What our timing solution dictates is that the nominal concepts *the dog* and *the man* must be *asynchronous* with respect to one another. If these two nominal concepts were to become simultaneously active, they would conceptually merge into a single (werewolf-like!) semantic specification. But now we have an engineering problem: how will the activation timing of the single relation be arranged with respect to the asynchronous activity of its two arguments? Let us imagine a relation like 'is biting' which is transitive, and thus has two open e-sites that must have NPS bound to them. The two NPS must be kept separate, so binding all three elements into a single synchronous activation will not work (it would merge all of their semantic specifications into an unstructured whole, with incomprehensible results). Keeping all three separate however will not work either, as then there will have been no binding at all, and the relationship of the NPS to the verb will remain unspecified. A paradox! Binding the verb to just one of the NPS and leaving the other one floating is not going to work either, as now we have no way of controlling which e-site the bound relation will be interpreted as coalescing with, and indeed the second NP will remain unbound.

It is easy to lose the thread of the argument here. Activation timing is the only tool available in this view to achieve the association of NP and incidental performance specification ('case role' if you will, although the concept of 'case role' is a more general one that the specific performance semantics envisioned here). No appeal can be made to symbolic coding. Given this, a binding consisting of a single NP with a transitive verb does not contain enough information to determine which e-site the NP is binding with (i.e., which role it has).[4]

A solution to this quandary is suggested in Hummel and Biederman (1992), which although perhaps initially uncomfortable for linguists (Hummel and Biederman work in visual perception), seems not only to work, but to be a difficult conclusion to avoid, given a temporal approach to binding. The idea is that there are only *intransitive* relations at the level of participant binding, and that multivalent relations thus consist of yoked constellations of single place predicates. The NPS must be kept separate, occasioning (in the case of a transitive relation) at least two timing phases. But they must also be synchronous with the relation in order to be bound to a specific role with respect to it. Two things cannot be at once synchronous with a third, and yet asynchronous to one another! The only solution is to split the relation.

In fact this is the conclusion we had already begun moving towards in considering the construction of *performers* above. So, in the proposition 'The dog is biting the man', what we are saying is that in fact we have four entities that will be directly involved in the translation step from the linear linguistic string to a conceptual image: [(the) dog], [(the) man], [X-is biting], and [is biting-Y] (or [Y is being bitten]). These last two are the functionally relevant single-place divisions of the verb *is biting*. Although we are forced, by the fact of there being only one verb in the English sentence, to **label** these two single-place predicates using the same lexical item, it is important to keep in mind that [X-is biting] and [Y-is being bitten] are *related* but *different* concepts. To spell it out: [X-is biting] has specifications of a toothed animate entity employing those teeth in an effort to harm or possibly eat something else. [Y-is being bitten], conversely, says very little about Y, except that some part of its external surface is suffering the strain of X's teeth, with whatever results are predictable on the basis of global knowledge about the structural consistency of Y, and the particular characteristics of the teeth of the incidental X. These two relations will share a direct linkage such that they will be yoked together in terms of activation, allowing that when [X-is biting] becomes active, [Y-is being bitten] perforce follows it in the next timing step. Of course, there will only be one actual lexical recognition (or *lemma*) node for the relation, as it will be a single lexeme in the speech stream, but this single recognition node will feed directly to one node of the binary binding structure, and that first-contacted node will subsequently activate its other half.

But why, one might reasonably wonder, would languages produce this odd distortion? Why compress sets of single-place predicates into single lexemes at all, when doing so seems to achieve nothing but excess processing strain in both perception and production (where the syntactic system produces and applies the distortion to the output)? In fact this may not be as mysterious as it seems. Consider what a system that rigorously maintained one-place surface forms would produce.

For the English verb *bite* (X,Y), such a language would have a pair of lexical relations, let's say *bi* (X) and *te* (Y). The sentence 'the dog bites the man' would thus be rendered something like *the dog bi the man te*. But these two lexemes, *bi* and *te* would co-occur with very high frequency, and may well form a unique combination (the specifications of *bi* may be such that it never pairs with anything but *te* and vice versa). Such a high degree of co-occurrence would naturally and automatically lead to the paired elements gaining unit status, and it is but a short step from there to imagine them fusing into a single lexeme.[5]

Such a hypothesis should lead us to expect evidence of such a process in natural languages, and indeed it is abundant. Serializing languages are replete with such formations, in all degrees of transparency, as the following examples from Yoruba show[6] (Rowlands 1969):

(1)	ó	gé	e	kù
	he	**cut**	**it**	**overlap**

He cut it so that there was some left over

(2)	aṣọ	yí	bá	mi	mu
	cloth	**this**	**(suit)**	**me**	**(suit)**

This cloth suits me (*bá…mu* is unanalysable)

and indeed such structures are nothing so exotic. English has very similar formations in its various periphrastic verb formations, such as periphrastic causatives *They* ***made*** *the child* ***cry***, and indeed phrasal verb constructions, such as *I* ***looked*** *the report* ***over***, and *We* ***called*** *the evening* ***off*** where the paired elements (verb + 'particle') are both relational, if not both verbal.

So, the suggestion here is that the existence of surface polyvalent relational lexemes is to be expected as a natural consequence of the lexicalization of co-occurring elements, and the linked evolution of such associated forms. The characteristics of any complex system will tend towards a local simplicity minimum. The fact that these local minima at different levels of organization do not match up, is neither surprising nor problematic.

This proposal also goes some way toward accounting for the difficulty of establishing any kind of finite set of case (or theta) roles. The implication of such an analysis of relational concepts is that *case roles are lexically specific*—directly controlled by the argument-specific nodes that comprise the relational array. Each relation thus will specify its own arguments in close detail, by virtue of the fact that the nominal concepts that can come into construction with it will be delimited by the semantics of the relation itself, and the established connections that have become entrenched through linguistic experience of actual speech events. Of course that is not to suggest that the processes of extension and generalization do not apply, but there is no reason to expect any pre-existing set of theta primitives; such categories are superimposed over sets of individual relational specifications. The appearance of such categories in natural language systems (i.e., the fact that certain grammatical functions and morphological classes can be seen to depend upon categories like *agent*, *patient*, *instrument*, etc.) results from language-community-specific generalizations over sets of relational expressions, but it is the expressions themselves that are primary. Such case-role categories average over sets of culturally relevant interactions in ways that are very likely to show some cross-cultural match-up due to species-general similarities in human cognitive systems, but this in no way suggests that the categories somehow pre-exist the expressions that instantiate them as a primitive set of possibilities.

5. CONCLUSION. I have argued for the necessity of a decoding step in linguistic processing which I have called *participant binding*, and that binding is achieved through temporal synchrony in the cognitive system at this level. This decoding is presumed necessary in order for the right kinds of information to be presented to the higher-order systems that mediate the construction of mental imagery—the same high level systems, in fact, which respond to perceptual inputs. Specifically, at the level of participant binding, a mechanism is necessary that can associate the correct NPS with the correct relational arrays, as well as keeping them active on separate time steps until such time as they have successfully been integrated into the higher level image. Where synchrony equals conceptual cohesion, allowing the participant bindings to cross-over in time would destroy their distinctness, and render it impossible to determine the respective case roles of the arguments. The kind of system required to achieve this will be one where the relevant bindings, once established, are reactivated in asynchronous cyclic patterns. A model that can do this is being developed and will be fully specified to the level of detail of individual nodes in a forthcoming publication. The present paper is intended to lay the groundwork for this model in terms of its aims, its motivation, and the conclusions suggested by its design constraints.

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[1] This is a simplification. If we imagine the recall of an event that was continuous through time, then we have an original stimulus which is both spatially and temporally distributed. The important thing is that the recall of this event will preserve its structure, and hence can still be thought of as phenomenologically isomorphic with the original percept.

[2] Note that this is in no way a rejection of the observation to be found in Langacker (1987) of action chains, and their real world iconicities. The 'billiard ball model' is a fine explanation for several aspects of syntactic structuring (an output phenomenon), but does not I believe apply to the perception (input) channel as directly.

[3] Although, given the predominance of spatially arranged maps in the cortex, it seems not unlikely that the answer will exhibit some kind of spatial structure as a key determinant. See Kosslyn (1994).

[4] Note that allowing the activation of a single relation to temporally span the asynchronous activation of the two nominals would indeed keep the nominals separate while aligning them with a single relation, but would fail to specify which nominal filled which relational role. Alleviating this problem by allowing that the relation not only *span* the activations of the two nominals, but also *alter* during its activation course, such that it allied appropriately different activation patterns with each nominal, is in fact exactly the same solution as I will go on to articulate here, albeit expressed slightly differently.

[5] Gapping of one NP under coreference would juxtapose the two intransitive verbs (the S in verb initial order—V1 (NPS) V2 NPO; the O in verb final—NPS V1 (NPO) V2).

[6] I am grateful to Bill Sullivan for pointing out to me (p.c.) that the variant possible analyses of constructions such as these make these examples less than compelling. This is a fair objection, and although better examples might be found, the argument they were offered in support of is in any case more of an appeal to logical probability, and is hopefully reasonable enough to stand on its own, even if the particular examples I have offered here are rejected.

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II. PHONETICS & PHONOLOGY

REANALYZING THE JAPANESE CODA NASAL IN OPTIMALITY THEORY

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Japanese is often said[1] to have a relatively simple syllable structure (Spencer 1996:81, among others), in which the coda consonants are more highly restricted compared to a language such as English. Many studies on Japanese phonology (Amanuma et al. 1983, Vance 1987, Nakajo 1989) analyze coda nasals as an archiphoneme /N/, which is distinct from the other nasal phonemes in Japanese, /m/ and /n/. There are two distinctive properties of the coda nasal to be differentiated from other nasal phonemes: (1) Various segments appear as allophones of /N/, and (2) /N/ can constitute a mora, unlike /m/ and /n/ in the onset (Vance 1987:38).

This paper proposes an alternative view of the coda nasal: The various nasal segments in the coda position are allophones of an alveolar nasal /n/, rather than an archiphoneme /N/. This analysis makes the analysis of Japanese simpler because the abstraction represented by /N/ is eliminated. This analysis of the coda nasal will be presented in the framework of Optimality Theory (henceforth OT): an OT analysis which assumes that /n/ is the underlying phoneme can describe both of the above properties of the Japanese coda nasal. The results of two experimental studies on Japanese speakers' performance in English will be provided as evidence.

1. Background: Traditional Analysis of the Japanese Coda Nasal. Various scholars claim that the Japanese coda nasal is a separate 'mora phoneme' which only appears lexically in the coda (Amanuma et al. 1983, Vance 1987, Nakajo 1989, Shibatani 1990). It appears as a uvular nasal [ɴ] before a pause (Vance 1987:34); it is articulated 'with the posterior part of the soft palate together with the uvula touching the back tongue' according to Nakano (1969:220). When the coda nasal is not followed by a pause, it appears as a wide variety of sounds due to place assimilation (Vance 1987:35), partly shown in Table 1 (also from Vance 1987:35). Other nasal and nasalized segments are reported as appearing as allophones of this coda nasal. Amanuma et al., for example, list 18 segments, including the nasal segments shown in Table 1.

There are two distinctive properties of the coda nasal to be differentiated from other nasal phonemes: (1) Various segments appear as allophones of /N/, and (2) /N/ can constitute a mora, unlike /m/ and /n/ in the onset (Vance 1987:38). It is impor-

hon mo	'book too'	[hom:mo]*
hon da	'is book'	[hon:da]
hon ni	'in book'	[hoɲ:ɲi]
hon ka	'book?'	[hoŋ:ka]

Table 1. Some allophones of the coda nasal. (*The symbol [:] after a nasal consonant means that the nasal is moraic.)

tant to note that various allophones of this coda nasal are written with the same symbol in Japanese syllabary (kana). Vance calls this the *mora nasal*, and it is also called *hatsuon* (literally 'skipped sound') in Japanese. It has been written as /N/[2] in the literature (Amanuma et al. 1983; Vance 1987; Nakajo 1989; Shibatani 1990).

2. AN ALTERNATIVE ANALYSIS. An alternative analysis I want to propose in this paper is that /n/ is the underlying form for the coda nasal (see Table 2). In the following sections, I will first reanalyze Japanese nasal phonemes in Optimality Theory (OT), and then I will briefly summarize the studies which support this analysis.

3. JAPANESE NASAL PHONEMES ANALYIZED IN OT. The alternative view of Japanese nasal phonemes will be presented in the framework of OT. Prince and Smolensky (1993:3) claim that languages have a universal set of constraints, and languages differ in the way they rank these constraints. Thus OT differs from derivational paradigms in the mechanism in which output is mediated (Archangeli 1997:13); and there are no intermediate forms between the input and the output, but all possible variants are produced in one step and evaluated in parallel (Prince & Smolensky 1993:5).

3.1. SYLLABLE STRUCTURE IN JAPANESE. According to Vance, all Japanese syllables conform to a shape proposed in the following schema (from Vance 1987:64):

(C)(y)V {V or N or Q}[4]

This schema can be interpreted with the following constraints: First, the relevant constraints are listed, and then, a partial ranking of them will be examined.

Phoneme[3]	**Distribution and characteristics**	**Example**
/m/	appears in the onset position only	*me* 'eye'
/n/	appears in the onset and coda positions;	*neko* 'cat'
	constitutes a mora when it appears in coda	*hon* 'book'

Table 2. Alternative view of Japanese nasal phonemes.

Syllable structure	Example	*COMPLEX	PEAK	FAITH [NAS]	DEP	ONSET	NO CODA
CV	*me* 'eye'						
CVN	*sen* 'thousand'						*
CVV	*koe* 'voice'						
VN	*en* 'yen'					*	*
CCV	—	*					
CC	—		*				

Table 3. Syllables in Japanese.

Relevant constraints are as follows:

*COMPLEX:	Syllables have at most one consonant at an edge.
ONSET:	Syllables begin with a consonant.
PEAK:	Syllables have a vowel.
FAITHFULNESS (FAITH):	
NASALITY:	Nasal segment/feature of the input has an identical correspondent in the output.
DEP:	Every segment/feature of the output has an identical correspondent in the output
ONSET:	Syllables begin with a consonant
NO CODA:	Syllables end with a vowel.

The crucial ranking is that FAITH [NAS] outranks NO CODA. Table 3 summarizes the possible syllable structures in Japanese (syllables which contain mora obstruents /Q/ are omitted from this table since they are irrelevant in this paper). C stands for consonants in general, and the coda nasal is not included in C. Although CVC syllables do exist in Japanese (e.g., *kit*.te 'stamp'), there are no words containing only a CVC syllable. CVC syllables are disregarded here for brevity's sake.

3.2. THE ALVEOLAR NASAL /n/ IN THE CODA. Some additional constraints are necessary to analyze the coda nasal. One of the properties of this coda nasal is that it can be realized as various nasal and nasalized segments phonetically. This characteristic can be described even if we assume that /n/ assimilates its place of articulation to the following segment. The relevant constraints are:

IDENTICAL CLUSTER CONSTRAINTS (ICC):
[PLACE]: A sequence of consonants must be identical in *place of articulation.*
FAITHFULNESS (FAITH):
PLACE/ONSET: Place of articulation of the input has an identical correspondent in the output.

/hon ka/ ‘book?’	icc [place]	faith [place/coda]	faith [nas]
[hon: ka][5]	*!		
☞[hoŋ: ka]		*	

Tableau 1. /n/ assimilation to /k/.

/hon/ ‘book’	icc [place]	faith [nas]	contrastive coda	faith [place/coda]
[hon:]			*!	
[hom:]			*!	
☞[hoɴ:]				*

Tableau 2. /n/ before a pause.

/hon ka/ ‘book?’	icc [place]	faith [nas]	faith [place/ onset]	contrastive coda	faith [place/ coda]
[hon: ka]	*!			*	
[hoɴ: ka]	*!				*
☞[hoŋ: ka]				*	*
[hoɴ:ʔa]			*!		*

Tableau 3. /n/ assimilation to /k/

place/coda: Place of articulation of the coda has an identical correspondent in the output.

Since the coda nasal assimilates its place of articulation but retains its nasality, it is apparent that icc [place] is ranked higher than faith [place]. Tableaux 1 illustrates place assimilation of the coda nasal.

The coda nasal loses its place of articulation in front of a pause, and it is phonetically realized as a uvular nasal [ɴ]. Pulleyblank noted that codas make poor hosts for a number of features, including place distinctions, and it is common that phonemes are neutralized in the coda position (1997:81). He proposes the following constraint, which requires that codas be minimally specified:

contrastive coda: A coda does not bear contrastive features.

The only way for the coda /n/ to satisfy the contrastive coda if for it to lose its point of articulation, i.e., it becomes [ɴ]. contrastive coda is ranked higher than faith [place/coda], since the underlying /n/ loses its point of articulation in the coda. It is, however, ranked lower than faith [nas], since the underlying /n/ does not lose its nasality. It is ranked lower than icc [place]: /n/ assimilates its place and does not appear as [ɴ] when it appears before another consonant, as follows:

/hon ka/ ‘book?’	ICC [PLACE]	FAITH [NAS]	MORA LICENSING	FAITH [PLACE/ ONSET]	CONTRASTIVE CODA	NO CODA	FAITH [PLACE/ CODA]
[ho ka]		*!					*
[honka]	*!		*		*	*	
[hon: ka]	*!				*	*	
[hoɴka]	*!		*			*	*
[hoɴ: ka]	*!					*	*
[hoŋka]			*!		*	*	*
☞[hoŋ:ka]					*	*	*
[hoɴ:ˀa]				*!			*

Tableau 4. /n/ assimilation to /k/.

> ICC [PLACE], FAITH [NAS], FAITH [PLACE/ONSET] >> CONTRASTIVE CODA >> FAITH [PLACE/CODA]

Tableau 2 shows that it is possible to describe [ɴ] before a pause as an allophone of /n/ with these constraints. Tableau 3 is a revised version of Tableau 1 with a candidate which contains [ɴ]. Only FAITH [PLACE/CODA], but not faith [PLACE/ONSET], is ranked lower than CONTRASTIVE CODA, so a candidate with [ˀ] at the onset is not an optimal candidate.

One of the distinctive properties of /N/ in the traditional analyses is the fact that it constitutes a mora. Hammond states a constraint (syllabic) LICENSING, which requires all words to be composed of syllables (1997:35). According to Hammond, LICENSING is ranked high in English, and all segments must satisfy this constraint: a hypothetical word like *tkin* is not possible in English, since *t* does not satisfy LICENSING (1997:41). It is known that a smaller phonological unit than a syllable, called a *mora*, plays an important role in Japanese and all the syllable-final consonants must constitute a mora (Shibatani 1990:140). I want to propose a constraint MORA LICENSING, which requires the last segment in Vance’s schema {V or N or Q} to have a mora in its own right:

> MORA LICENSING: Each segment in rhyme must bear a mora.

Since nasal segments in coda are not deleted, I assume MORA LICENSING is ranked higher than NO CODA. Tableau 4 is a revised version of Tableau 3, with more candidates and constraints.

3.3. CONTRAST BETWEEN THE TRADITIONAL ANALYSIS AND THE ALTERNATIVE ANALYSIS. Now reconsider the two major properties of /N/ in traditional analyses: (1) Various segments appear as allophones of /N/; (2) /N/ can constitute a mora,

Traditional analysis		**Alternative analysis**	
Phonemes and Archiphoneme	*Distribution and Characteristics*	*Phonemes*	*Distribution and Characteristics*
Bilabial nasal nasal /m/	Onset only	Bilabial nasal /m/	Onset only
Alveoloar nasal /n/	Onset only	Alveolar nasal /n/	Onset and coda Moraic in coda
Mora nasal /N/	Coda only[6] Moraic		

Table 4. Comparison of traditional and alternate views.

unlike /m/ and /n/ in the onset (Vance 1987). As seen in Tableau 4, an analysis which assumes that /n/ is the underlying phoneme can describe both properties. Thus, it is not necessary to have an archiphoneme /N/, but reconsideration of the phoneme /n/ is needed.

Differences between the traditional analysis of the coda nasal and the alternative analysis proposed here are summarized in Table 4. The main advantage of the alternate analysis is that the analysis of Japanese becomes simpler, without the abstraction represented by /N/.

4. Evidence from Japanese Speakers' Performance in English.

4.1. Japanese Speakers' Perception of English /n/. Findings from studies of Japanese speakers' performance in English support the alternate analysis which proposes /n/ as the underlying phoneme of the coda nasal.

A significant difficulty in distinguishing English coda /n/ and /N/ was found in Japanese speakers' perception (Aoyama 1997a). This study was originally motivated by two hypotheses: (1) there are not significant differences between Korean and Japanese speakers for the contrast of /m/ and /n/ in word-initial position in English, since both languages distinguish the phonemes /m/ and /n/ in the onset. (2) Korean speakers will have less difficulty in distinguishing contrasts in the coda because Korean distinguishes these phonemes in the coda. Japanese speakers will have difficulties distinguishing /m/, /n/ and /ŋ/ in the coda because of the interference of the archiphoneme /N/.

The data were collected from native speakers of Korean in Seoul, Korea, and from native speakers of Japanese in Osaka and Tokyo, Japan. There were 40 subjects, 10 Korean females and 10 Korean males, and 10 Japanese females and 10 Japanese males. Their ages ranged from early 20s to mid 50s. All of them had studied English through the secondary school systems in Korea or Japan. Their length of stay in an English speaking country, however, was limited (less than a year), if any. There were also 20 native English speakers who listened to the same tape as a control group. There were 10 males and 10 females among this group as well.

	Korean (20 subjects) Number	 Percentage	**Japanese** (20 subjects) Number	 Percentage	**English** (20 subjects) Number	 Percentage
Type 1	21	10.5%	14	7.0%	12	6.0%
Type 2	12	6.0%	54	27.0%	2	1.0%
Type 3	10	5.0%	15	7.5%	2	1.0%
Type 4	24	12.0%	23	11.5%	12	6.0%

Table 5. Number of mishearings in each type and subject group.

Forty minimal pairs were listed on an answer sheet, and the listeners were asked to select the word they heard from the corresponding pair. There were four different types of minimal pairs: Type 1, word-initial /m/ vs. /n/ (e.g., *mitt* : *knit*); Type 2, word-final /n/ vs. /ŋ/ (e.g., *sin* : *sing*); Type 3, word-final /m/ vs. /ŋ/ (e.g., *swim* : *swing*); and Type 4, word-final /m/ vs. /n/ (e.g., *seem* : *scene*). Each type included five pairs and each pair was examined twice so that both words from each pair were read aloud one time.

As seen in Tables 5 and 6, the Japanese speakers had considerable difficulty in distinguishing /n/ and /N/ in coda position. All but one of the Japanese speakers misheard at least one of the pairs in this type. The percentage of mishearings among the Japanese speakers for Type 2 was higher by far than the other three types (27.0% vs. 7%, 7.5% and 11.5%).

In the Japanese data, statistically significant differences were found only between Type 2 (-n vs. -ŋ) and others (χ^2=15.45, $p < 0.001$). No significant difference was found between Types 1 (m- vs. n-), 3 (-m vs. -ŋ) and 4 (-m vs. -n) (χ^2=2.41, $p > 0.1$). This means that Japanese speakers had approximately the same number of mishearings in Types 1, 3 and 4, although Type 1 consisted of onset minimal pairs and Types 3 and 4 consisted of coda minimal pairs. Thus, the distinction between English nasal phonemes in the coda was not in general difficult for Japanese speakers, although nasal phoneme distinctions do not exist in the coda in Japanese. Rather, the difficulty was in the distinction of particular English phonemes, /n/ and /ŋ/.

Interestingly, Japanese speakers misheard English /ŋ/ as /n/ more than they misheard /n/ as /ŋ/. (81.5% of the total mishearings, see Table 7 and Figure 1). Japanese speakers had a very hard time in distinguishing /ŋ/ and /n/ when the target word contained /ŋ/ word-finally, as in sing (44 mishearings out of 100 tokens).

Whether or not [ŋ] is a phoneme in Japanese is a matter of controversy (cf. Vance 1987:110, Nakajo 1989:76–78). There may be some minimal pairs contrasting non-initial [g] and [ŋ], such as [daigo] 'fifth' and [daiŋo] 'an emperor's name' in some varieties of Japanese (Nakajo 1989:77), but the contrast is marginal at best. Hibiya (1995) observed a rapid ongoing change from [ŋ] to [g], and showed that young Tokyo speakers tend to have [g] where older speakers have [ŋ] or variation between [ŋ] and [g]. For the younger speakers in Hibiya's study, this intervocalic

Stimulus	Perceived final		
	/m/	/n/	/ŋ/
[m]	192	7	1
[n]	16	174	10
[ŋ]	14	44	142

Table 6.Overall results: Japanese speakers' perception.

[ŋ] could be simply an allophone of [g]; then [ŋ] is not a phoneme for the younger speakers.

All but one of the Japanese subjects in this study were in their 20s or early 30s. Therefore, for the relatively young speakers represented in this study, [ŋ] could be simply an allophone of [g]. The observed difficulty of distinguishing English /ŋ/ from /n/ is evidence that [ŋ] is an allophone of the coda nasal in Japanese.

In addition, Japanese speakers did not have difficulty with Type 3 (-m vs. -ŋ). This tells us that Japanese speakers can distinguish /ŋ/ from /m/. In the traditional analysis of the coda nasal, [m], [n] and [ŋ] are all allophones of /N/; however, this type of analysis does not explain why Japanese speakers did well on /m/ vs. /ŋ/, but had difficulty with /n/ vs. /ŋ/.

In Type 4 (-m vs. -n), the tendency of mishearings was opposite from Type 2 (-n vs. -ŋ). Japanese speakers preferred /m/ in a pair such as *scene : seem* (see Table 8). This denies that the preference of alveolar /n/ in Type 2 (-n vs. -ŋ) was simply because of orthographic influence (the coda nasal is usually spelled with the letter *n* in Japanese romanization). If it is mere orthographic influence, we would expect that Japanese speakers would prefer /n/ in both Types 2 (-n vs. -ŋ) and 4 (-m vs. -n); however, this preference for /n/ was found only in Type 2, and not in Type 4.

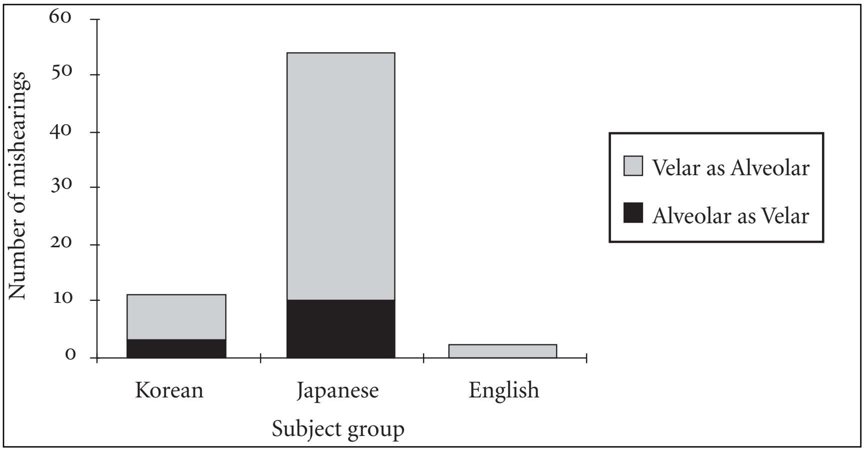

Figure 1. Tendencies of mishearings in Type 2.

	Number of mishearings (=27% of Type 2)	Percentages in total mishearings of this type
[n] heard as /ŋ/	10	18.5 %
[ŋ] heard as /n/	44	81.5 %

Table 7. Japanese speakers' tendency to mishear Type 2: word-final /n/ vs. /ŋ/.

	Number of mishearings (=11.5% of Type 4)	Percentage of total mishearings in this type
/m/ heard as /n/	7	30.4%
/n/ heard as /m/	16	69.6%

Table 8. Japanese speakers' tendency of mishearings in Type 4: word-final /m/ vs. /n/.

4.2. Japanese Speakers' Production of English /n/. In the perception study, I found that Japanese speakers showed considerable difficulty in distinguishing /n/ and /N/ in the coda position. I hypothesized that similar patterns of difficulty would be found in their production of nasal phonemes as well. Accordingly, Japanese speakers' production of English nasal was also investigated (Aoyama 1997b).

Six native Japanese speakers (3 male and 3 female international students at the University of Hawai'i at Mānoa) were asked to read a list which consisted of 14 simple English monosyllabic words containing a nasal phoneme either in the onset or coda. The speakers' lengths of stay in the u.s. or other English-speaking countries varied: the shortest was 2 months, and the mean was 3.3 years. One speaker had spent his early years (ages 3 to 9) in the uk, and one year of his adolescence in Idaho. However, the difference in length of stay was not controlled, since the differences among individual speakers were not the main focus of this study.

The recordings were done in the language laboratory at the University of Hawai'i at Mānoa. The speakers were asked to come to the laboratory individually, and they read the word list in the investigator's presence. A recording technician controlled the sound level in the room next to the one where the speaker and the investigator were sitting. Each subject read both the number and the word (for example, 'One, *mitt*' and 'Fourteen, *seem*') into the microphone.

Japanese speakers did not have difficulty producing the English /m/ and /n/ in the onset. Each speaker read the words *mitt* and *knit*, and their pronunciation was summarized in Table 9. Each speaker read four words for both /m/ and /n/: *swim*, *some*, *seem*, and *same* for /m/, and *sin*, *kin*, *scene*, and *sane* for /n/. They did not have particular difficulty in producing /m/ in the coda either (Table 10). /m/ was pronounced as [m] by all speakers, although one speaker added epenthetic [ɯ] in two of the six words (*swim* [swɪmɯ] and *some* [səmɯ]). This was a surprising finding:

Intended	[m]	[n]
/m/	6	0
/n/	0	6

Table 9. Japanese speaker's production of /m/ and /n/ in the onset position.

Japanese speakers did not have difficulty in producing /m/ in codas, although /m/ does not contrast with other Japanese nasals in the coda in Japanese.

A variety of sounds appeared when the Japanese speakers intended to produce /n/ in codas (see Table 10); /n/ was pronounced as [n] in only 9 out of 23 utterances (39.1%), and /n/ was most often pronounced as [ɴ] (13 out of 23, 56.5%). One speaker pronounced a nasalized vowel, which is reported to appear as an allophone of the coda nasal (Shibatani 1990:139): *sane* was pronounced as [sẽĩ].

Since the task was to read a word list, the speakers produced all these nasal phonemes before a pause. More than half (60.1%) of the Japanese speakers' production of English /n/ corresponded to a typical pronunciation of Japanese coda nasal before a pause. Thus, it is possible that the Japanese speakers believed that English nasal /n/ to be the same or at least similar to the Japanese coda nasal, and pronounced English /n/ as in Japanese.

One important thing to note here is the fact that Japanese speakers' confusion of English /n/ with the Japanese coda nasal did not affect the production of English /m/: /m/ was almost always pronounced as [m] in the coda as well as in the onset. If the Japanese coda nasal is underlyingly /N/, both /m/ and /n/ should be difficult, since they are both allophones of /N/ in the traditional analysis. However, Japanese speakers were able to produce final /m/, while they had difficulty producing final /n/. The difference of difficulty in producing /m/ and /n/ denies the analysis that they are perceived as mere allophones of the coda nasal.

4.3. Limitations of the Studies. There are some limitations of these studies. First, the Japanese speakers' production cannot be strong evidence of an underlying /n/ for the coda nasal. The coda nasal is usually spelled with the letter *n* in Japanese romanization and it is possible to analyze its production as the influence of Japanese orthography. It is possible that Japanese speakers regarded the English /n/ as the same as Japanese /n/ simply because of orthography.

Second, the subjects' backgrounds were not controlled in either study. The data collections were done randomly in Seoul, Osaka, Tokyo, and Honolulu. The places in which the subjects grew up, their age and their English proficiency (for Korean and Japanese speakers) were not well-controlled. The subjects' original hometowns were not taken into consideration in these studies. This might affect the data, since some dialects of Japanese retain the velar nasal as a phoneme (Vance 1987); consequently the Japanese speakers who speak those dialects might have performed better than speakers of other dialects did.

Intended	[m]	[m+ɯ]	[n]	[ɴ]	[ẽɪ]
/m/	22	2	0	0	0
/n/	1[7]	0	9	13	1

Table 10. Japanese speaker's production of /m/ and /n/ in the coda position.

4.3. Summary of the Studies. Japanese speakers demonstrated significant difficulty in perceiving and producing the English phoneme /n/: they had difficulty distinguishing /ŋ/ from /n/ in the perception study, and their production of English /n/ was similar to that of the Japanese coda nasal. Other contrasts in the coda position (/m/ vs. /ŋ/, and /m/ vs. /n/) were found to be as easy to distinguish as the contrast of /m/ vs. /n/ in the onset. These results are problematic if one assumes that the coda nasal is an archiphoneme /N/ in Japanese; the traditional analysis of the coda nasal as an archiphoneme /N/ with [m], [n], and [ŋ] as allophones would predict that perception and production of all English nasal phonemes in coda would be equally affected. The uneven difficulty found in Japanese speakers' perception and production supports the alternative analysis of the Japanese coda nasal: it is underlyingly /n/, not an archiphoneme /N/.

5. Conclusion: In the traditional analysis of Japanese, the coda nasal has been analyzed as /N/, an archiphoneme. This paper shows that it is theoretically possible to analyze the coda nasal as underlying /n/; further, studies of Japanese speakers' performance in English support this analysis.

One might wonder why Japanese speakers distinguish syllable-final /m/ from /n/ and /ŋ/ easily, but have difficulty distinguishing syllable-final /ŋ/ from /n/. An archiphonemic analysis is unable to account for Japanese speakers' differential ability to distinguish and produce English syllable final nasals.[8] I propose that a sound which is recognized as a phoneme in one position (/m/ in the onset in Japanese) is easier to distinguish in other positions, where the sound does not occur in the native language. I propose that [ŋ] is only an allophone for the young Japanese subjects who participated in the studies; therefore, English [ŋ] is not perceived as itself but often as /n/. [m] and [n] are phonemes of Japanese, so English [m] and [n] are perceived as themselves.

In conclusion, I propose a non-archiphonemic analysis of the Japanese coda nasal, which makes the analysis of Japanese simpler because the abstraction represented by /N/ is eliminated.

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[1] I thank Barry Cowan, William O'Grady, Ann Peters, and anonymous reviewers for reading an earlier draft of this paper. I am especially grateful to Fraser Bennett, Patricia Donegan, Blaine Erickson, Shin Ja Hwang, Paul Lassettre, and Bill Sullivan for extensive comments and discussion they provided.

[2] It is not clear whether /N/ stands for a uvular /ɴ/ or an archiphoneme /N/ in the traditional analysis (for instance, Vance 1987). In either case, however, it is clearly differentiated from the alveolar /n/; thus, whether it is an archiphoneme or a uvular nasal is not crucial to the argument in this paper. I take /N/ in the traditional analysis as an archiphoneme in this paper. I thank an anonymous reviewer who made this point clear.

[3] Whether /ŋ/ is a phoneme or not is another problem in the Japanese nasal phoneme inventory, but I will not discuss it in this paper.

[4] Vance mentions the exception of over-long syllables; for example, /*tooQ*-ta/ 'pass-PERFECTIVE'. These over-long syllables are in fact rather common. Including over-long syllables is, however, beyond the scope of this paper. Thus the following analysis of Japanese syllable structure is based on Vance's schema.

[5] Why the nasals are moraic will be explained shortly.

[6] Vance mentions some cases of /N/ appearing utterance initially (1987:39); however, he agrees that /N/ occurs only after a vowel aside from marginal examples.

[7] The speaker pronounced *sane* as [səm] probably because it was an unfamiliar word for him. This token is not further considered in the discussion.

[8] It is pointed out that the alternative analysis I am claiming here does not provide evidence for this difference much more clearly. Blaine Erickson and Patricia Donegan pointed out an analysis of the coda nasal as phonemic /m/ and /n/. This accounts for Japanese speakers' ability to produce and perceive English /m/ in the coda. An anonymous reviewer also pointed out to me a claim of Freedom of the Input (FOTI) in OT; the constraints are all on the output. Thus, even if we assume that underlying form is /m/, the surface form will be the same.

It may be true that my analysis does not go far enough to fully explain why /n/ is the underlying phoneme; further investigation is needed to see if /n/ really is the underlying phoneme of the coda nasal in native Japanese words.

Sullivan (p.c.) has pointed out that /m/ and /n/ may be easier to perceive as distinctive because the point of articulation of [m] is visible. However, this cannot explain Japanese speakers' ability to distinguish /m/ from /n/ in the coda for several reasons. First, only auditory stimuli were provided in this study, and Japanese speakers could not see the point of articulation. Second, native English speakers had same difficulty distinguishing /m/ and /n/ in the coda in their own native language (see table 5). Third, it is reported in the literature that [m] and [n] are perceptually more similar than [m], [n] vs. [ŋ] (Black 1969, Thomas 1992).

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ACOUSTIC VERSUS PHYSIOLOGICAL LENITION: THE REVISED MOTOR THEORY IN ACTION

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1. The Fortis-Lenis Scale. One of the most problematic and nebulous features in phonetics and phonology has been the gradual opposition of the fortis-lenis scale, in which we classify certain consonants as 'stronger' or 'weaker' than other consonants. To be sure, the simple privative or binary oppositions traditionally characterized as fortis and lenis have caused little problem at all. For example, the plural stem of English *knife* [naif] is *knive-* [naiv], reflecting a voicing lenition in Anglo-Saxon. Such developments have been well accepted in linguistics since Meillet's observation that 'one will not be surprised to see the tendency to reduce the finals, to see intervocalic consonants undergo the influence of neighboring vowels and thus be made like them by becoming voiced or by losing a part of the closure' (Meillet 1970:9).

The gradual or scalar opposition, however, is very problematic. Typical of such scales is the gradation from [ð] to [d] to [t] (or [tʰ]) to [θ], from lenis to fortis. Of course, we clearly see the scale in such historical changes as 'Grimm's Law', as documented from Grimm 1822 to Bomhard 1996 (see also Griffen 1988). Nonetheless, the problem of relating the degrees along the scale by a single phonetic parameter has been so troubling that such linguists as Vennemann and Ladefoged (1973) and Bauer (1988) have denied that such a justification can exist.

2. Welsh Lenition. The problem is particularly acute in the Welsh consonant mutations—a system of initial gradation that began as phonetic variations and now reflects grammatical relationships and that are well established in the literature (compare Morris Jones 1913; Morgan 1952; Jackson 1953; Lewis & Pedersen 1974; Harvey 1984, among many). As in linguistics in general, such specialists as Ball and Müller (1992) have tended to avoid the very notion that such a relationship exists, because they cannot find a single phonetic parameter upon which to base it.

In several publications (from Griffen 1975 to 1993), the phonetic justification for this scale has indeed been demonstrated. As shown on the spectrogram in Figure 1 (supported by the values of the individual spectra of the consonants), the phonetic justification for the fortis-lenis scale lies in the relationship between consonant and vowel—a relationship in which the consonant obstructs and constrains the vowel with which it is coarticulated. On the spectrogram, over time certain frequencies

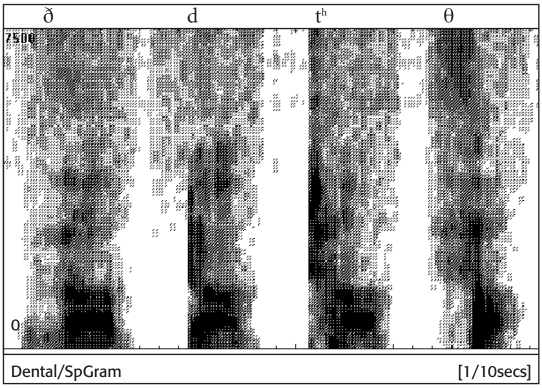

Figure 1. Spectrogram of the nonsense syllables [ðə də tʰə θə]

show a greater or lesser amplitude or loudness. As the lower frequencies mark the vocalic emission and the higher frequencies mark the consonantal obstruction, the progression from lenis [ð] to [d] to [tʰ] to fortis [θ] can be seen in the ratio of high-to-low frequency emissions—the relatively greater amount of dominant amplitude in the higher frequencies as one progresses 'up' the scale. The progressive dominance of this higher frequency 'noise' is characteristic of the phonetic feature of aspiration, and the scale is thus termed an aspirate fortis-lenis scale.

The aspirate-based mutation system of Welsh is illustrated in Table 1 (following page). In this scale, a loss in one degree of aspirate intensity in the environment will cause a lenition (a shift 'down' the scale), while an addition of one degree will cause a provection (a shift 'up' the scale).

For example, in pre-Welsh Brythonic the feminine definite article ended in a vowel, while the masculine did not. Consequently, the initial consonant of the following article was intervocalic for the feminine and thus subject to lenition along the scale. This has resulted in such pairs as feminine *de* [de:] 'right (side)' ~ *y dde* [əðe:] 'the right' as opposed to masculine *de* [de:] 'south' ~ *y de* [əde:] 'the south', and feminine *ton* [ton] 'skin (surface)' ~ *y don* [ədon] 'the skin' as opposed to masculine *ton* [ton] 'lay-land' ~ *y ton* [əton] 'the lay-land'.

3. IRISH LENITION. At around the same time that pre-Welsh Brythonic was developing lenition based upon the loss of one degree of aspirate intensity, pre-Irish Goidelic was also developing a system of consonant mutation. These two languages were very much in contact, and there are numerous incidences of one borrowing a word from the other and 'adjusting' it for sound changes that had already been completed. For example, as Brythonic was a P-Celtic language and Goidelic was a Q-Celtic language, words beginning in *p* in the one often correspond with words beginning in *q* or *c* in the other. Centuries after this change was completed, British

Position of obstruction (orders)	**Degree of Aspiration (Series)**			
	Susurratae 1 aspirate {1h}	Mediae 2 aspirate {2h}	Aspiratae 3 aspirate {3h}	Spirants 4 aspirate {4h}
	Obstruents			
labial	*f* [v]	*b* [b]	*p* [pʰ]	*ff/ph* [f]
dental	*dd* [ð]	*d* [d]	*t* [tʰ]	*th* [θ]
velar	–	*g* [g]	*c* [kʰ]	*ch* [χ]
	Liquids			
lateral	*l* [l]			*ll* [ɬ]/[l̥h]
trill	*r* [r]			*rh* [r̥h]
	Nasals			
labial		*m* [m]		*mh* [m̥h]
dental		*n* [n]		*nh* [n̥h]
velar		*ng* [ŋ]		*ngh* [ŋ̊h]

Table 1. The Welsh aspirate mutations

missionaries introduced the root *pask-* 'Easter' (Latin *pascha*) to Ireland, and the Irish promptly changed it to *casc-* (compare Thurneysen 1980:570–72; also Schmidt 1993 on the relative dating).

Given this close affinity, it is rather surprising that Old Irish lenition appears to go 'up' the fortis-lenis scale—there seems to be in effect a strengthening of the consonantal obstruction in a weakening environment. For example, Latin *frater* 'brother' corresponds with Old Irish *bráthir* (Thurneysen 1980:77). Given the analysis above, this would involve a change from the more lenis [tʰ] to the more fortis [θ] in an environment that would predict a change in the opposite direction—[tʰ] to [d].

While this may appear to be a simple case of frication, other developments in the system would indicate a greater complexity and would render such an hypothesis untenable. A more complete representation of Old Irish lenition is found in Table 2, in which the terminology follows Thurneysen 1980.

It appears from the overall pattern that the strategy used in Old Irish lenition is a reduction in the degree of constraint (quite in keeping with Meillet's view of lenition above). Moreover, the further development of the Irish lenition system bears out this assessment, as the reduction of constraint has indeed run its course in several instances, as in the further weakening of [ð] to null and of [tʰ] to [h] (compare Ó Saidhail 1989:111–14).

Stops		**Spirants**		**Continuants**	
Radical	**Mutation**	**Radical**	**Mutation**	**Radical**	**Mutation**
c [k^h]	*ch* [χ]	*ch* [χ]	null	*s* [s]	*h* [h]
t [t^h]	*th* [θ]			*w (f)* [w]	null
p [p^h] (loans)	*ph* [f]			*m* [m]	*m* [μ]
g [g]	*g* [γ]	*g* [γ]	null	*n* [n]	*n* [ν]
d [d]	*d*[ð]	*d* [ð]	null	*l* [l]	*l* [λ]
b [b]	*b* [β]			*r* [r]	*r* [ϱ]

Table 2. Old Irish lenition

4. Two Models of Lenition. Evidently, the difference between these two models of lenition lies in the means by which each is produced and perceived. The Welsh model is based upon the acoustic characteristics heard by the listener, while the Irish model is based upon the physiological characteristics produced by the speaker. That the strategy behind lenition should be different in different languages is certainly not surprising, for a phonological distinction can be made on the basis of a number of different phonetic parameters (a point that will prove crucial below).

However, the juxtaposition of these two models based upon completely different approaches to the speech signal—one acoustic and one physiological—in languages in contact and at least partially comprehensible to one another raises a dilemma. The Welsh acoustic model is clearly perceived in the reduction of the high-to-low frequency ratio—the 'lowering' or 'weakening' of the aspirate intensity.

If such an acoustic cue is a valid ramification of lenition, then how can the Irish system ignore the cue? How can the Irish system employ what is clearly a degree of fortition in order to effect lenition? And (most to the point) upon what acoustic signal is the Irish lenition based?

An examination of the acoustic evidence reveals nothing upon which we can base the Irish lenition. The Welsh lenition is quite clearly manifested in the acoustic data as a degree of aspirate constraint. Yet in the Irish system, the decrease in aspirate constraint accounts for some lenition, but other lenition is accounted for by an apparent increase in aspirate constraint.

The Irish mutation system finds itself in essence in the same dilemma in which the Welsh mutation system found itself—along with Grimm's Law and a host of other phenomena—prior to the discovery of the aspirate basis of its fortis-lenis scale. While some system was obviously there, there was no single phonetic parameter that would justify it—at least, no single phonetic parameter that we have become accustomed to in our previous analysis.

Of course, the dilemma for Irish exists only in the light of the Welsh system, just as the dilemma for Welsh existed only in the traditional binary/privative systems of phonology. The Irish mutation system can be fully justified simply by noting that the phonetic basis for the system lies in the physiological degree of constraint. While the Welsh system is acoustic, the Irish system is physiological.

5. The Traditional Motor Theory. Identifying the difference between the systems, however, raises a more serious problem for phonology in general. The acoustic parameter of the Welsh system is the stimulus for the response by the listener—the interpretation of the utterance within the system. We hear a well-established set of acoustic properties as the stimulus, and this provides the cause for the communicative effect.

But what of Irish? We could say that the acoustic stimulus lay in the feature of continuance, if the system were that simple. Rather, the basis of the system lies in a physiological relaxation of the obstruction that is manifested acoustically in different ways. The only way the listener can interpret the system is through the physiology—upon hearing a lenition, one realizes that it corresponds with a relaxation of the physiology.

In one case, then, the listener interprets the signal as perceived; while in the other case, the listener appears to interpret the signal as produced. However, unless one is closely examining the speaker's oral gestures, one cannot interpret those gestures. Since the Irish can understand each other even when they are not observing each other's oral apparati, the situation becomes somewhat more complicated: one does not interpret the speaker's gesture directly, but one interprets what one realizes that one must produce oneself in order to say the same thing.

This is quite in accordance with the traditional motor theory of speech perception, which has been debated and has been in and out of fashion since Liberman et al. 1962 (see Hardcastle & Laver 1997:252). From a traditional generative standpoint, this 'analysis by synthesis' would appear to justify the transformational generative approach, as argued early on by Halle and Stevens (1964). The justification, of course, lies in the interpretation of what is generated—the application of the production rules enables the entire communicative process.

Once again, however, the rather simple explanation is complicated by the fact that while Irish has developed a physiologically based system, Welsh has developed an acoustically based system. In the one, one interprets what one would have to produce in mimicry; but in the other, one must interpret the effect of the mimicry—what one would acoustically interpret from what one would physiologically produce from what one acoustically receives from what another physiologically produces. This is no simple analysis by synthesis, but rather an analysis of an analysis by synthesis.

That the traditional motor theory of speech perception is strongly supported by the Irish system is quite evident. Given that support, however, one must recognize from the Welsh system that the analysis by synthesis is not a unidirectional generative event, but rather a bidirectional and perhaps even an interstratal event. Once again, we are faced with something of a discrepancy; although, to be sure, there appears to be some opportunity for an accommodation.

6. The Revised Motor Theory. The accommodation arises in the more recent 'revised motor theory' of Liberman and Mattingly (1985). This theory is based upon two claims:

> The first claim of the motor theory, as revised, is that the objects of speech perceptions are the intended phonetic gestures of the speaker, represented in the brain as invariant motor commands that call for movements of the articulators through certain linguistically significant configurations. (ibid:2)
>
> The second claim of the theory is a corollary of the first: if speech perception and speech production share the same set of invariants, they must be intimately linked. (ibid:3)

The precise neural gestures involved in the revised motor theory are dependent upon the system used in the particular language. As such, what are termed 'potential cues' may be interpreted differently within different linguistic systems. Certainly, this allows for the acoustic interpretation of the Welsh and the physiological interpretation of the Irish systems both relating to neural gestures consistent with the fortis-lenis scale. Beyond this simple accommodation, however, lies the observation within the theory that 'the relation is systematic because it results from lawful dependencies among gestures, articulator movements, vocal-tract shapes, and signal' (ibid:6).

The revised motor theory thus departs from the traditional approach in that the physiological parameters and the acoustic parameters that apparently underlie fortis-lenis relationships are indeed related in what may be seen as an interstratal event in the form of the systems of neural gestures. That is, the system of neural gestures is the basis of the fortis-lenis scale, and this can be cued by either the auditory reception or the potential physiological production.

Actually, the relationship is far more intrastratal than interstratal. In the revised motor theory, 'the neural representation of the utterance that determines the speaker's production is the distal object that the listener perceives; accordingly, speaking and listening are both regulated by the same structural constraints and the same grammar' (ibid:30). This, of course, even more directly supports the nondichotomous relationship of the fortis-lenis scale in Welsh and Irish.

7. Conclusion. During a period in history when the two languages were in rather frequent contact, Welsh and Irish developed systems of lenition along gradual fortis-lenis scales that appear on the surface to be diametrically opposed to one another. In some cases, lenition in the one appears to be fortition in the other and

vice versa. Within traditional approaches to phonetics and phonology, accommodating both systems within the same conceptualization of the fortis-lenis relationship does not appear to be possible, since one is physiologically based and the other is acoustically based.

Looking beyond the 'distal' objects to the cognitive 'neural gesture', however, we can account for both systems within a framework in which physiological production and acoustic perceptions are both handled within the same component or module. Such an approach can account for the discrepancies and for the perception that the apparently dichotomous systems are indeed essentially the same.

Certainly, the case of the mutation systems in the Celtic languages very pointedly supports the revised motor theory, providing empirical evidence to the systematic accommodation of production and perception within the same framework of neural gesture.

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SYLLABLE REDUCTION AND GHOST SYLLABLES IN TIRIYÓ

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Tiriyó is a member of the Cariban language family (see Gildea 1998 for an overall picture) spoken by approximately 2,000 people on both sides of the Brazil-Surinam border in Amazonia. To this day, Tiriyó remains virtually undescribed, aside from a few publications (Migliazza 1965 and Jones 1972 on segmental phonology; Carlin 1997 on nominal possession, Meira 1998b on rhythmic stress) and word lists gathered by explorers and missionaries. The data in the present work comes from my own field work among the Tiriyó.[1]

Throughout the Cariban family, there is a certain allomorphic pattern which involves various degrees of 'weakening' and ultimate loss of stem-final syllables. Adam (1893) was the first to mention this pattern; Gildea (1995) gives a detailed comparative perspective. The aim of the present paper is the description of this pattern in Tiriyó and of some of its consequences for the morphology of the language.

1. Tiriyó Syllable Reduction. Basically, the pattern of syllable reduction in Tiriyó involves morphemes with several allomorphs differing only by their last syllable (which will be called the *reducing syllable*)[2]. These allomorphs are:

(i) the *full* (or *CV*) grade, in which the reducing syllable is in its full form;
(ii) the *reduced* grades, of which there are two:
  (a) the *coda* (or *C*) grade, in which the reducing syllable is replaced by a single consonant, either /h/ (if the reducing syllable has a stop or /r/) or /N/[3] (if the reducing syllable has a nasal), which becomes the coda of the preceding syllable;
  (b) the *length* (or *VV*) grade, in which the reducing syllable is absent, but the final vowel of the preceding syllable is long;
(iii) the *zero* (or Ø) grade, in which the reducing syllable disappears entirely.

The following table illustrates the syllable reduction pattern with two verb stems: /pono(pï)/ 'to tell (a story)' and /ona(mï)/ 'to bury, to hide' (parentheses mark the reducing syllables), conjugated in the first-person form (*w(i)-* prefix). The full grade form is in the /-Ø/ immediate past, followed by the particle /nkërë/ 'still, yet; again'; the coda grade form, in the /-ta/ future; the length grade form, in the /-ne/ remote past; and the zero grade form, in the /-Ø/ immediate past without any

Allomorph	/pono(pï)/ 'to tell (a story)'		/ona(mï)/ 'to bury, to hide'	
Full (CV) Grade	wi.-**po.no.pï**_n.kë.rë	'I still told'	w-**o.na.mï**_n.kë.rë	'I still hid'
Coda (C) Grade	wi.-**po.noh**.-tae	'I will tell'	w-**o.nan**.-tae	'I will hide'
Length (VV) Grade	wi.-**po.noo.**-ne	'I told'		
Zero (Ø) Grade	wi.-**po.no**	'I told'		

Table 1. The allomorphic pattern of syllable reduction.

following particle (hyphens [-] mark morpheme breaks, while dots [.] mark syllabic breaks; the underscore character [_] marks a clitic boundary).

In general, the distribution of the different allomorphs has the following characteristics (as can be seen in Table 1):

(a) The zero grade occurs when no overt suffixes are added.
(b) A reduced grade occurs when a suffix or enclitic is added to the stem.
(c) Reduced grades are prevented from occurring when the potential result would contain a sequence of segments that cannot be syllabified as any of the attested syllable types.[4] In these cases, the full grade occurs, so that the undesirable sequence is avoided. Thus, in Table 1, the stem /pono(pï)/ 'to tell (a story)' cannot occur in any of its reduced grades when followed by the particle /nkërë/, since this would generate unsyllabifiable sequences (*/hnk/ for the coda grade /ponoh/, */oonk/ for the length grade /ponoo/); the full grade /ponopï/ is used instead. In other words: the full grade occurs when the following suffix or enclitic contains material that needs a preceding CV syllable in order to syllabify (i.e., when the suffix or enclitic is a single consonant, or begins with a consonant cluster); otherwise, one of the reduced grades occurs.[5]

Figure 1 represents this situation schematically, showing that the only way to add a C(CV…)-initial suffix or enclitic to a reducing stem is by selecting its full grade; all possibilities involving a reduced grade would have to contain unattested syllables. Single dots represent syllable breaks; triple dots represent the (possible) rest of the word or affix; parentheses delimit optional elements; asterisks mark impossible syllabifications (the unattested syllables that make them impossible are underlined); # represents the end of the phonological word.

It must be noted that the length and zero grades do not exist for all reducing morphemes. The following generalizations can be formulated:

(a) Morphemes with a non-nasal reducing syllable (stop + V or /r/ + V) have both the coda (in /h/) and the length grades. The coda grade is used whenever the phonotactics of the language allow the resulting

Full grade:	(…)CVCV	+	C(CV...)#	→	(…)CV.CVC(.CV...)#
Coda grade:	(…)CVC	+	C(CV...)#	→	* (…)CVCC.(CV...)#
					* (…)CVC.C(CV...)#
					* (…)CV.CC(CV...)#
Length grade:	(…)CVV	+	C(CV...)#	→	* (…)CVV.C(CV...)#
					* (…)CV.VC(CV...)#
					* (…)C.VVC(CV...)#

Figure 1.

cluster (i.e., when it is /ht/, /hp/ or /hk/); otherwise, the length grade is used. So, in Table 1, the stem /pono(pï)/ 'to tell (a story)' occurs in the length grade /ponoo/ with the suffix /-ne/, since a combination of /-ne/ with the coda grade /ponoh/ would create an unattested */hn/ cluster.

(b) Morphemes with a nasal reducing syllable (i.e., NV) only have one reduced grade: the coda grade in /N/, used in all reducing environments. They also lack a zero grade. Thus, the stem /ona(mï)/ 'to bury, to hide', has no length or zero grade; its coda grade /onaN/ (realized as /onan/ or /onam/, depending on the following segment) occurs in all reducing situations. The two missing forms in Table 1 are thus /w-o.nan.-ne/ (with a long /n/) and /w-o.nan/, both based on the coda grade /onaN/.

Table 2 summarizes the above claims.

2. Origin of the syllable reduction pattern. The situation outlined above clearly has a diachronic explanation. Internal reconstruction in Tiriyó, as well as comparative evidence, suggest that the full grade was the original form of the stem in all environments. At some point in time, a historical process of erosion affected certain syllables, causing them to become weakened. The first step was probably

Full (CV) Grade + C(C…)	Coda (C) Grade + /p, t, k, (s)/	Length (VV) Grade + /r, m, n, w, y/	Zero (Ø) Grade no overt suf./encl.
-CVCV	-CVh	-CVV	-CV
-CVNV	-CVN		

Table 2. The allomorphic pattern of syllable reduction.

vowel loss, with the consequent formation of consonant clusters (cf. Gildea 1995 for a general overview of this phenomenon in the Cariban family).

In Tiriyó, clusters in which the first consonant was /p/, /t/, /k/, or /r/ changed this consonant into /h/ by means of a process of articulation loss ('debuccalization'). When the second consonant was not a stop, this /h/ was simply dropped, after causing the compensatory lengthening of the preceding vowel. Word-finally, /h/'s and long vowels were lost. This process gave rise to the reduced and zero grades. Clusters in which the first consonant was a nasal probably were originally non-homorganic (a situation which still obtains in the related language Wayana, which has words like /munpë/ 'mouse' or /imta/ 'his/her mouth'). The present-day situation would follow as the result of an assimilatory process.

Since syllable reduction and loss was a phonological diachronic process, it also affected monomorphemic words (cf. /mahto/ 'fire', /enya/ 'hand', /empane/ 'teacher'). In fact, Gildea (1995) claims that all cases of consonant clusters or long vowels, regardless of whether or not they are involved in synchronic alternations, ultimately result from syllable reduction. For Tiriyó consonant clusters, this appears to be the case; for Tiriyó long vowels, syllable reduction may have been the main source, but it was not the only one (cf. Meira 1998a:60).

It is a difficult task, still unresolved among Caribanists, to decide what diachronic factors conditioned syllable reduction. The stress system probably played an important role, but, as Gildea (1995) has pointed out, in ways that are not clear yet. Simple solutions like 'unstressed syllables reduce' fail miserably.

For a synchronic description of Tiriyó, this failure to understand the motivation of the diachronic process implies that it is difficult to predict which stems undergo reduction (i.e., that have full, reduced, and zero grades). Certain general features can be noted:

(i) the reducing syllable in its full grade is always of the CV type;
(ii) the vowel is usually /ï/ or /u/;
(iii) the consonant is usually a stop (/p, t, k/), a nasal (/m, n/), or /r/.

3. The zero grade and free variation. The zero grade occurs in principle only when no suffixes or enclitics are added to the reducing stem. In the case of nominal stems, this is the case; e.g., /emeku(nu)/ 'wrist', /epe(tï)/ 'medicine' and /apëre(mï)/ 'owner' occur as /emekun/, /epe/ and /apëren/ when no suffixes or clitics follow (and are in fact much more frequently found in this form than in any other). Verbal stems, on the other hand, do not do that. The two verb forms that most closely resemble a 'suffixless' form are the /-Ø/ 'immediate past' form, and the /-Ø/-nominalized form (used with the /_se/ 'desiderative' postposition). Interestingly enough, in the /-Ø/-past form, the zero and full grades appear to be in free variation; in the /-Ø/-nominalized form, only the full grade can occur.

(1)

Stem	/-Ø/-past ('I did V')	/-Ø/-nominalization ('I want to V')
/pono(pï)/ 'to tell O'	/wi-pono/ ~ /wi-ponopï/	/i-ponopï_se wae/
/ku(ku)/ 'to try O'	/wi-ku/ ~ /wi-kuku/	/i-kuku_se wae/
/ewe(tï)/ 'to feed O'	/w-ewe/ ~ /w-ewetï/	/ewetï_se wae/

4. Unsuspected lexeme-final long vowels. Because of the syllable reduction pattern, the existence of 'reducing elements' at the end of a word (i.e., the existence of a full grade) can be tested by the addition of the appropriate enclitic. This led to the discovery of a few monosyllabic morphemes that have only the zero and the length grade (i.e., they had a 'hidden long vowel'), but no traces of the coda and full grades. These will be cited with a (V) at the end; e.g., /ma(a)/ 'far', /wï(ï)/ 'I', /pï(ï)/ 'mountain', /-ti(i)/ 'Collective'. In the examples below, these morphemes are given with the particles /_nkërë/ 'still, yet; again' (with which the full grade should occur), /_ta(ike)/ 'Negation' (which should condition the coda grade), and with the clitic copula forms /_nai/ 'he/she is' and /_wae/ 'I am' (which should occur with the length grade).

(2)

Isolation	/_nkërë/	/_ta/	Copulas
/ma/	/ma_nkërë/	/maa_ta/	/maa_nai/
/pï/	/pï_nkërë/	/pïï_ta/	/pïï_nai/
/wï/	/wï_nkërë/	/wïï_ta/	/wïï_wae/

5. The case of possessive /-(rï)/. There is one morpheme which is itself a CV monosyllable in its full grade, and which, as expected, occurs as /h/ in the coda grade, as simple vowel length in the length grade, and disappears completely in the zero grade: the possessive marker /-(rï)/, which marks possessed stems. The examples below are based on the stems /pata/ 'village, place', and /pakoro/ 'house', with the first-person possessive prefix /yi-/.

(3)

Zero Grade (Isolation)	Length Grade (/_me/ 'Attrib')	Coda Grade (/_ta/ 'Negation')	Full Grade (/_ya/ 'to, by')
/yipata/ 'my place'	/yipataa_me/	/yipatah_ta/	/yipatarï_ya/
/yipakoro/ 'my house'	/yipakoroo_me/	/yipakoroh_ta/	/yipakororï_ya/

The morpheme /-(rï)/ has thus the interesting property of depending crucially on the form of the following material (affixes/clitics) for its realization. The same possessed stem can have its possessed status indicated by nothing at all (when no affixes/clitics follow), by vowel length, by /-h/ or by /-rï/. In texts, the zero-grade form is by far the most frequent.

Cognates of /-(rï)/ in other Cariban languages are usually obligatory. In Tiriyó, however, it is phonologically absent most of the time. The most plausible interpretation seems to be that Tiriyó is in the process of losing this morpheme: the historical process of syllable reduction has already eroded it in most of the situations where it used to occur, and it would be no surprise if this were followed by the loss of the other forms (/h/ and vowel length). Presumably, the presence or absence of a person-marking prefix is a better clue to distinguish possessed from non-possessed stems than the elusive presence of /-(rï)/.[8]

6. Conclusion. The present paper has attempted to describe certain cases of stem alternations in Tiriyó, and to relate them to a historical process of syllable reduction and loss which generated different results depending on (a) what kind of syllable it affected and (b) what kind of syllables surrounded the affected syllable.[9] The results of syllable reduction will, of course, vary from language to language, but any researcher who decides to study a Cariban language will probably have to face some form of this phenomenon.

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[1] The transcription follows my analysis of Tiriyó phonology. The symbols /ï/ and /ë/ represent a high and a mid central vowel ([ɨ] and [ə]), respectively.

[2] There are cases in which the first rather than the last syllable of the stem is affected. These are, however, irregularities that fall outside the scope of the present paper.

[3] The symbol N represents a 'generic' nasal, which assimilates in point of articulation to the following consonant. In the transcription of lexical examples, it is replaced by its realization, as /n/ or /m/.

[4] For Tiriyó, the possible syllable types are CV, CV_h, CVN, CV_iV_i, CV_iV_j, CV_iV_jh, CV_iV_jN (N is the 'generic' nasal; V_iV_j represents a diphthong; V_i-V_i represents a long vowel).

[5] There are exceptional CV-initial morphemes that do not trigger reduction (e.g., the postposition /ya/ 'by, to'). For these cases, diachronic explanations will hopefully be found (e.g., in the case of /ya/, comparative evidence shows that it comes from a Proto-Cariban form */wïya/, which probably, at some point, reduced to a CCV-initial form /wya/).

[6] The evolution of syllable reduction has further led to a dialectal split. There are two main dialects of Tiriyó, which I call h-Tiriyó (spoken mostly in the eastern half of the Tiriyó area) and k-Tiriyó (spoken mostly in the western half of the Tiriyó area). In h-Tiriyó, /hp/ and /hk/ clusters have become [hɸ]~[:ɸ]and [hx]~[hh]~[:h], while /ht/ clusters are still [ht]; in k-Tiriyó, all /h/ clusters have lost the /h/, with compensatory lengthening of the preceding vowel.

[7] The existence of a length grade must be the result of the historical process of syllable reduction and loss. In fact, cognates of these monosyllabic morphemes from other languages are not monosyllabic (e.g., Karihona /mïha/ 'far', Wayana /ïpï/ 'mountain', Kaxuyana /owï/ 'I'). Nevertheless, the absence of the coda and full grades still awaits an explanation.

[8] This situation brings to mind the case of the few remaining nominal case endings in modern German (for instance, the dative plural *-n* in e.g., *Männern* 'to the men'). In almost all contexts, the form of the article or the presence of prepositions like *zu* or *nach* are much better indicators of the dative case than the suffix *-n*, which could probably disappear entirely without being missed.

[9] Similar phenomena are attested in other languages. Famous cases include French *liaison*, which involves word-final consonants (e.g., the final /(t)/ in *petit*, which is pronounced only if the following word is vowel-initial: *petit homme* /pətitɔm/, but *petit bateau* /pətibato/), and the kinds of Celtic mutation that involve 'throwing a consonant forward' if the following word begins with a vowel (e.g., the definite article *an*, which prefixes a *t* to a following masculine vowel-initial word, like *an t-ainm* 'the name', but not to a consonant-initial one, like *an fear* 'the man'). In these languages, as in Tiriyó, the present-day alternations are the result of processes of phonological erosion. In French, there even are morphemes which behave like the Tiriyó /-(rï)/: the nominal plural *-s*, the verbal second-person singular *-s*, the verbal third-person plural *-ent*.

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III. SYNTAX

THREE-CASE PREPOSITIONS IN POLISH: THE SEMANTICS OF *PO*

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In a case language, such as Polish, prepositions do not exist in isolation from case—an occurrence of a preposition requires the presence of an oblique case-marker on the word or a group of words that preposition precedes.[1]

Polish prepositions combine with one, two or occasionally, three different cases each. The preposition *po* is one of two Polish prepositions that can be found with three cases, the other preposition in the three-case set being *za* 'behind, over, during', which combines with INST, ACC, and GEN. As illustrated by the examples in (1), *po* combines with LOC, ACC and DAT, in that order, considering the combination's frequency of occurrence. Sentence (1)a expresses the subject's movement along a path designated by the shape of the object evoked by LOC; in (1)b the movement of the subject is oriented towards a goal specified by the ACC-marked nominal; in (1)c, the subject is perceived as distributed into segments according to the price unit indicated by the DAT-marked element.

(1) a. *Kominiarz idzie* **po drabinie**-LOC.
The chimney-sweep *is going* **up (or down) the ladder**.
b. Kominiarz *idzie* **po drabinę**-ACC.
The chimney-sweep *is going* **for (to fetch) the ladder**.
c. Te bułki *idą* (colloquial for *sprzedają się*) **po złotemu**-DAT.
These rolls *go (sell)* **for one złoty each**.
(NOTE: *Złoty* is a Polish monetary unit.)

In this paper I will examine various uses of the three *po*+CASE combinations. The aim of the analysis is to determine the semantic motivation for case selection in each set of the *po* data. In particular, I will try to establish what semantic elements in the meaning of the preposition *po* make it compatible with its three cases, i.e., LOC, ACC and DAT.

I have chosen the preposition *po* as the subject of this analysis for two reasons: first, because the problems its wide-ranging uses present for a unified semantic description are fairly representative of the type of problems posed by other multi-case Polish prepositions; second, because the treatment *po* has been given in the relevant literature on the semantics of prepositions in Polish (Weinsberg 1973, Kempf 1978, Cienki 1989) is both incomplete and unsatisfactory.

1. Theoretical Assumptions. The assumption I am working from is that the meaning of a prepositional phrase in a case language like Polish is determined by the meaning of the case, the meaning of the preposition and the semantics of the entity the prepositional phrase in question refers to, be it the event expressed by the predicate verb (*Przyszedł po obiedzie*-loc, 'He came after dinner') or an object evoked by the modified noun (*herbatka po obiedzie*-loc, 'tea after dinner'; *woda po pas*-acc, 'water up to [reaching] the waist'). All these meaning elements have to be compatible, and none can a priori be said to carry more weight than the others (see Rudzka-Ostyn quoted in Janda 1993:205). Yet, since Polish has significantly more prepositions than cases (There are 7 cases and 70 prepositions—see Grochowski 1976:75), it seems reasonable to assume that the meaning of cases is more general (and more abstract) than the meaning of prepositions. Consequently, in this analysis of the uses of *po*, cases are considered to provide objective points of reference, in spite of the one-form/one-meaning principle that would suggest the opposite, preposition-to-case direction in the analytical procedure, since in the prepositional *po*-phrases the preposition remains constant and the cases it combines with change.

2. Prototypical meanings of the Polish locative, accusative and dative. The view that a preposition is a lexical exponent of a specific actualization of the abstract case meaning rests on the Jakobsonian assumption that it is possible to identify one basic meaning for each ie case and consequently provide a uniform semantic description of the case's uses (whether one approaches the task through Jakobson's feature system, the Guillaumean method of the potential significate or the cognitive grammar network modelling procedure based on a prototype).

In keeping with this assumption, I am adopting the general descriptions of the Polish loc, acc and dat, as formulated in (2). The characteristics proposed for these cases agree with the localist locative versus directional perception of the basic case functions (see a good introduction to the localist theory of case in Lyons 1968:300; cf. also the work of e.g., Hjemslev 1935, Anderson 1971, Kuryłowicz 1977) and are based on the results of my previous research on the Polish loc (see Bacz 1996, 1997) and on the work on the Polish dat by Wierzbicka (1988) and by the late Rudzka-Ostyn (1996):

(2) locative—a case which denotes the presence of the entity it refers to (the profiled entity) within the confinements of the *Localizer*, i.e., the territory (or *Place*) of the entity evoked by the loc-marked nominal.
(Weinsberg 1973, Cienki 1989, Bacz 1997)
accusative—a case which denotes or implies a motion of the entity it refers to toward the Localizer and designates the fact that the entity has either entered or not yet entered the territory evoked by the Localizer.
(Weinsberg 1973)

(2) DATIVE—a case that 'seems to always imply a change or a possibility of a change'
(Wierzbicka 1988:397)
PREPOSITIONAL DATIVE—a case expressing the notion of Landmark (LM), i.e., the notion of a point of reference for the profiled entity.
(Rudzka-Ostyn 1996)

The above meaning of LOC corresponds to Weinsberg's (1973) description of the relation of direct location. In his system of spatial relations expressed by prepositions in Polish, German and Rumanian, the static relation of *direct location* is opposed to the dynamic, lative relations of *adlativity* (motion toward the Localizer), *ablativity* (motion from the Localizer) and *perlativity* (motion within the Localizer). Polish ACC is an exponent of *adlativity*. What distinguishes this case from LOC, however, is not the contrast between static location and (ad)lativity, but the fact that the presence of the entity evoked by ACC on the territory of the Localizer is not obligatory (see Weinsberg 1973:77). The meaning suggested for the Polish ACC is markedly different from the prototype for this case proposed by Smith (1993:533) on the basis of his analyses of the ACC material in German. Smith claims that ACC case grammaticalizes the notion of the *contact image* between the path of a trajector and a significant aspect of the landmark (i.e., 'either the landmark itself or a region associated with the LM'). In his formulation 'the prototypical meaning of ACC centers on the fundamental conceptual notion of one entity coming into physical contact with another entity' (Smith 1993:533). The characteristic of ACC suggested here focuses on the difference between ACC and LOC, and the meaning established for LOC constitutes a point of departure for the description of ACC.

The characteristics of the Polish DAT as a case involving change, and of the prepositional DAT as a provider of the notion of Landmark, summarize what Wierzbicka (1988) and Rudzka-Ostyn (1996) have been able to establish regarding the case's most abstract, 'general' meaning. A meticulous analysis of the multifarious DAT uses in Polish carried out by Rudzka-Ostyn (1996) has led the author to the perplexing and unrevealing conclusion that the prepositional forms of that case represent 'the highest degree of schematicity allowed by the dative network'. It should be pointed out that Rudzka-Ostyn's study of the Polish DAT does not include a discussion of the case's *po*-uses.

3. *PO* + LOCATIVE USES. *Po* is distinguished from the other four locative prepositions in Polish (*w* 'in', *na* 'on', *o* 'about' and *przy* 'next to') by the fact that its most common use evokes an activity involving motion. Thus, the most typical occurrence of LOC *po* requires the co-presence of a verb of motion in the sentence, as illustrated by examples (1)a, (3)a and (4)a. The movement denoted by the *po*+LOC phrases in these sentences can be described as 'unoriented' since its starting or ending points are not specified. Predictably, the verbs of motion used in these *po*-

examples (*iść* 'go', *chodzić/spacerować* 'walk', *płynąć* 'float/swim', *biegać* 'run', etc.) also express 'unoriented', or neutral (Smith 1993), movement.

3.1. MOTION ON A SURFACE.

(3) a. Dziecko *biega /?biegnie* **po ulicy**-LOC.
The child *is running* (imperf./?perf.) **in the street**.
b. Dziecko *biegnie* **przez ulicę**-ACC.
The child *is running* **across the street**.
c. Dziecko *biegnie* **ulicą**-INST.
The child *is running* **in/along the street**.

It should be noted that unoriented (or *perlative*—see Hjemslev 1935:95) movement within the limits of a Localizer can be expressed in Polish also by means of ACC with the preposition *przez* or by bare INST, as illustrated by examples (3)b and (3)c. The difference between the motion uses of *po* versus the motion uses of *przez*+ACC and of INST lies in the fact, that LOC *po* denotes movement on a surface (3)a while ACC with *przez* (3)b indicates movement across an obstacle, and the bare INST (3)c signals movement along a path which is conceived as a necessary attribute of the profiled activity (see Bacz 1993:420). Thus, the LOC *po* uses in (1)a, (3)a or (4)a can be described as motion equivalents of the location-on-a-surface uses of the LOC preposition *na* 'on', a fact that is illustrated by examples (4)a and (4)b.[2]

(4) a. Kot *chodzi* **PO dachu**-LOC.
The cat *is walking* **on the roof**.
b. Kot *siedzi* **NA dachu**-LOC.
The cat *is sitting* **on the roof**.

3.2. DISTRIBUTION. Linked to the concept of MOTION in the semantics of motion-on-a-surface *po*-phrases is the idea of DISTRIBUTION, profiled in all types of usage illustrated in (5). In the most typical examples of such distributive use of *po*, the LOC-marked nominal is found in the plural. This means that the territory of the Localizer is perceived as an area divided into or containing segments or specific points that are being highlighted by the motion.

(5) a. Moja żona stale *biega* **po sąsiadach**-LOC.
My wife constantly *runs* **from one neighbour to another**.
b. Chłopak *skacze* **po kamieniach**-LOC. na rzece.
The boy *is jumping* **from stone to stone** in (on) the river.
c. Samolot *rozrzuca ulotki po* **mieście**-LOC.
The plane *is throwing flyers* **all over the city**.

(5) d. *Czerwone plamy wystąpiły* dziecku *po* **całym ciele**-LOC.
Red spots have appeared **all over the child's body**.
e. Janek *bije* Marka **po twarzy**-LOC.
John *is beating (hitting)* Mark **on/all over the face**.
f. Dziecko *szalało* **po pokoju**-LOC.
The child *was going crazy* **all over the room**
g. *Nalej* gościom **po kieliszku**-LOC. wina.
Give (pour out) the guests **a glass of wine each**.

In (5)a the movement of the subject (my wife) is seen as distributed over several neighbours' households (particular parts/ segments of the neighbourhood—i.e., the Localizer). In (5)b, the path of the boy getting across the stream by jumping from one stone to another is also perceived as divided into stages marked by the stones he steps on. In both examples, (5)a and (5)b, the evoked motion can be described as irregular or chaotic; the subject's path is visualized as a line that links several points in the territory in a haphazard manner, creating an impression of total coverage.

In (5)c, which contains a verb prefixed by the distributive prefix *roz-*, the motion evoked by the flyers being thrown out from the plane can be described as 'radial'. The movement is conceptualized as emanating from one source (the plane) in different directions. The end-result of the motion: the distribution of the flyers, is more salient than the motion itself. It is the sentence's direct object (flyers), not the LOC nominal (city), that is marked for plurality, and the territory of the Localizer is depicted in the mind through the distribution process; it is sketched by the objects that are being distributed (the flyers).

Also in example (5)d, with the subject noun (spots) bearing the mark of plurality, the end-result of the underlying motion is in focus: the spots are distributed all over the child's body. The overt presence of a lexical verb of movement (e.g., *breaking out in chicken-pox*) is not necessary. The motion which has caused the distribution of the objects profiled in the depicted scene is implied by the result. The spots are distributed in a chaotic fashion, and the impression that the territory of the Localizer (the child's body) is being completely covered is strengthened by the presence of the adjective *cały* 'whole' in front of the LOC-marked nominal *ciało* 'body'.

Example (5)e contains no plurality markers, but its predicate designates a dynamic iterative activity. The repetitive motion evoked by the verb *bić* 'beat' results in a haphazard distribution of individual hits (places of contact with a body part) on (i.e., all over) the face of the affected object.[3]

In example (5)f, representing another chaotic meaning attached to *po*, no nominals are marked for plurality and the predicate verb does not designate an iterative, distributive activity. Yet, a strong impression of chaotic movement is produced due to the lexical content of the verb *szaleć* 'go mad, go wild' which implies disorderly behaviour. The presence of the LOC *po*-phrase suggests that the child's craziness manifests itself through the activity of running about. The territory of the Localizer is obviously covered by the movement, but no break-up points are distinguished in the path traced by the moving entity and no obvious distributive effect is produced. The idea of chaotic movement is more salient in the conceptualization underlying this example than the notion of the resultant distribution.[4]

In the last example in the series of distributive uses of *po* (5)g the idea of distribution does not create the impression of chaos but produces the semantic effect of regularity. The sentence evokes an undefined amount of beverage that is measured out, i.e., distributed in equal quantities. The LOC-marked nominal *kieliszek* 'glass' (used in the singular) denotes a unit of measurement in the action of pouring the wine out. The movement designated by the verb is seen as linear and the wine is distributed in equal portions. This use of *po* is common with numerals placed before the LOC nominals of measure.

3.3. SEQUENTIAL MOVEMENT. The impression of chaos associated with most of the spatial uses of LOC *po* disappears when the structure is transferred to the domain of time. Time is perceived as a line, and events happening in time are ordered along that line, so they cannot be seen as distributed chaotically. In (6)a, where *po* means 'after', Jan's coming (the entity referred to by the locative PP) takes place after the activity of having dinner (the entity localizing the other entity in time), and the two entities involved in the relationship are perceived as ordered according to the linear passage of time. Example (6)b is a direct temporal equivalent of the motion-on-a-surface spatial uses such as (5)a and (5)b. The subject's work is seen as covering a period of several nights, one after the other. The distribution of the activity over a number of nights is more important than the linear character of its path.

(6) a. Jan *przyszedł* **po obiedzie**-LOC.
John *came* **after dinner**.
b. Jan *pracuje* **po nocach**-LOC, a śpi w dzień.
John *works* **night after night** and sleeps during the day.

In the temporal LOC uses, such as (6)a and (6)b, the path followed by the 'localized' entity (the trajector) is traced by time. In the spatial uses where the localizer's territory is perceived as a path the LOC-marked nominal denotes an object linear in shape (such as a ladder in example (1)a, or a line, rope, wire or thread) or an object that appears to be moving away, as are *the footsteps* in example (7)a. In the abstract uses of LOC *po*, such as the use in (7)b which depicts a causative relationship, or the use in (7)c, which might be described as genetic (see Kempf 1978), the situation that had taken place earlier conditions the perception of the situation that followed. Thus, the situation 'before' can be described as tracing the path for the situation 'after'. The use of LOC in the examples imparting an idea of sequential movement is motivated, for the entity referred to is always visualized as present on the territory of the Localizer. In (7)b the accent (which is the LOC LM) belongs to Jan, the localized trajector (TR), so the mental spaces evoked by the two entities overlap. In (7)c, the profiled entity (the can) is simultaneously the Localizer's territory (LM), imagined as a container that has been evacuated by the object evoked by the LOC nominal (the sardines); that empty territory can now be filled by another occupant. In (7)d, the profiled entity (the violin) is conceptualized as having moved into the Localizer area emptied by the LOC-denoted entity (the father). The violin inherited from the father is seen as an object that took over the place that used to be father's; in a sense, it came to be Jan's after it was the father's.

In the last two examples of sequential use the LOC *po*-phrase indicates position determined with respect to the entity denoted by the LOC-marked nominal. Captain in (7)e is seen as coming after God in the conventionally accepted hierarchy (vertical ordering). The right-hand side of the Father in (7)f (or any other specific part of an object) can be determined only with respect to the object's vertical or horizontal axis which has to be known before. So, the activity or state taking place in a defined part or position of the Localizer-object expressed by the *po*-phrases such as *po prawicy* 'on the right-hand side' (the noun *prawica* is archaic in modern Polish), *po środku* 'about the centre', *po wierzchu* 'all over the surface', etc. implies a mental movement into that position from a point of reference.

(7) a. *Idę* **po twoich śladach**-LOC.
I *am walking (following)* **in your footsteps**.
b. *Poznali* Janka **po akcencie**-LOC.
They *have recognized* Jan **'after' (because of) his accent**.
c. To jest *puszka* **po sardynkach**-LOC.
This is a *can* **after sardines**.
(= This can used to contain sardines.)
d. Jan *oddziedziczył te skrzypce* **po ojcu**-LOC.
Jan *inherited this violin* **'after' (from) his father**.
e. Kapitan *jest pierwszym* **po Bogu**-LOC.
Captain *is the first one* **after God**.
(= Captain comes first after God.)
f. '…*siedzi* **po prawicy**-LOC Ojca…'
'…sits at the right hand of God, the Father…'
(from *Apostles' Creed*)

The conclusion following from the above survey of the LOC uses of *po* is that the semantic composition of this preposition can best be characterized as a combination of three basic concepts: unoriented motion on a surface, distribution and sequential movement.

4. PO + DATIVE USES. The occurrences of *po* with DAT are very rare in modern Polish. Historically, DAT was the case used to denote movement on a surface in situations depicted by examples such as (1)a or (4)a, as is still the case in Russian. It was replaced by LOC because of the formal identity of the DAT and the LOC case-markers in all but masculine declensional paradigms (see Kempf 1978:117–18) and because of an obvious similarity in function between the two cases in some uses. In modern Polish, the use of the DAT *po* structures is limited to two types of *po*+adjective sequences illustrated by examples (8)a and (8)b. The first type denotes distribution, practically identical to the type of distribution indicated by LOC in example (5)g. Any distribution is a consequence of a dynamic activity, and it is significant for the present analysis that Wierzbicka (1988) defined the Polish DAT as an essentially dynamic case. This dynamic characteristic of DAT is still apparent in the *po*-motion uses of LOC that have developed from the DAT uses. Thus, what the LOC and the DAT uses of *po* have in common is the distributive function linked to motion.

The DAT case form in the second type of *po*+DAT phrases (example (8)c) is a remnant of the old nominal-declension paradigm used to denote Adj-N phrases of indefinite reference (see Tokarski 1978:153–58; Miodek 1987:131–32). Many of the DAT-marked adjectives in these *po*-phrases are derived from or related to the corresponding nouns (*po polsku* 'in Polish'~*Polak* 'a Pole', *po pijanemu* 'when being drunk'~*pijany/pijak* 'a drunk', *po ojcowsku* 'like a father'~*ojciec* 'a father', etc.), and the structure always indicates a mode of behaviour or being, characteristic of the objects evoked by these nouns. This usage of *po* with the DAT-marked adjectives resembles the sequential use of LOC *po*. A salient characteristic of the nominal entities evoked by the structure provides a model referred to in the description of the manner in which the activities evoked by the sentences under consideration are carried out. In (8)b, the subject is told to live according to the commandments given by God. In (8)c, the subject speaks according to the model set by the speakers of the language. Following a model in the abstract DAT uses, such as those in (8)b and (8)c, is like following a path traced by the LOC-marked entity in the sequential uses.

(8) a. *Sprzedawał* bułki **po złotemu**-DAT.
He *was selling* rolls **for one złoty each**.
b. *Żyj* **po bożemu**-DAT.
Live **according to ('after') God's commandments.**
c. *Mówię* **po polsku**-DAT.
I can *speak* **Polish ('according to/ after the way the Polish people speak')**

5. *Po* + Accusative Uses. There are only two types of the ACC uses of *po*, illustrated by the examples in (9) and (10), respectively. In the first type, the *po*+ACC phrase co-occurs with a verb of motion, and the ACC-marked nominal denotes a GOAL of that motion. The motion can be described as *neutral* with respect to the direction of the

movement the verb in question expresses, a significant characteristic of the *po*-ACC sentences, shared with the movement-on-a-surface LOC uses (e.g., the verb *iść* 'go' is used in both (1)a and (1)b). The effect produced by these *po*-ACC sentences, however, is clearly that of a goal-oriented, directed activity, an impression due to the meaning of ACC. Thus, what brings the LOC and the ACC uses of *po* together is the preposition's potential for expressing motion, which remains 'unoriented' when LOC is used and becomes *adlative* with ACC. It should be observed that with the LOC *po*, the profiled entity is always present on the territory of the Localizer; in the ACC *po* sentences, such as (1)b or (9)a and (9)b, the profiled entity is placed outside the territory of the Localizer, which is perceived as a goal to be attained.

(9) a. Ojciec *pojechał* **po lekarza**-ACC.
Father *went* **to fetch ('for') the doctor**.
b. Matka *poszła* **po cukier**-ACC.
Mother *went* **to buy ('for') sugar**.

In the second type (the examples in (10)) the ACC-marked nominal denotes spatial limits of a container evoked by the profiled entity. The motion verbs used or implied by this structure (*wpaść* 'fall into', *napełnić* 'fill up') evoke the activity of filling up, or plunging into a container, and the preposition *po* invokes a sense of COMPLETENESS. The movement designated by the verbs of motion in this structure requires that the path traced by these activities (plunging into or filling up) goes all the way through the Localizer's territory until the very limit of its boundaries. Smith (1993:543) observes that the completeness and the goal senses of ACC (which are both found in the German uses of the case) are compatible because goal implies contact with the LM (the Localizer) and 'contact with the LM of the preposition implies the completeness of a goal-oriented path'. This explanation can be adopted for the two types of the *po*-accusative in Polish, the difference between German and Polish being that in German, ACC-expressed contact with the Localizer is actual (Smith 1993), and in Polish, it is potential. In Polish, expressing a goal (by means of ACC) does not imply that it will be reached.

(10) a. Jan *napełnił szklankę* **po brzegi**-ACC.
Jan *filled the glass* **to the brim**.
b. 'śniła mi się wielka rzeka, *wielka rzeka pełna mleka* **aż po samo dno**-LOC.'
'I dreamt of a big river, a *big river full of milk* **down to the very bottom**.'
(From *Pan Kotek*, a popular poem for children)

6. CONCLUSIONS. The above examination of the *po*-data in Polish has shown that this preposition's compatibility with three different cases is motivated by its semantic potential and by the functional similarities between LOC, ACC and DAT.

In its semantic composition, *po* combines three basic features compatible with the meaning of the three cases: unoriented motion, distribution and sequential movement (which might, upon further examination, be shown to follow from the unifying idea of following a configuration of something). The potential for expressing motion allows the preposition to combine with the Localizer-confined meaning of LOC, the dynamic nature of DAT, and the goal and completeness senses of ACC. The notion of distribution, shared by the LOC and the DAT uses of the preposition, is also seen as the result of the motion characteristic of *po*. The idea of sequential movement, salient in some LOC uses of *po* has been shown to conform to the general LOC requirement that the profiled entity be present on the territory of the Localizer.

A significant conclusion following from the above analysis of the *po* uses in Polish relates to the prediction made by Kuryłowicz (1977:147) concerning 'functional coincidence of cases in IE languages'. According to this prediction, in the system of IE cases the linguist proposed in accordance with the localist theory, 'it is always possible that the immediately adjacent members [in the schema] exhibit functional coincidence (with the exception of the locative-ablative axis)'. The member closest to IE LOC in Kuryłowicz's system is *the directional*, realized as ACC or DAT. The analysis of the LOC, ACC and DAT uses of the preposition *po* in Polish confirms the 'functional coincidence' of these three cases predicted by that linguist for the IE languages.

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[1] The term *oblique case* is used to denote cases different from the nominative and the vocative, the oblique cases in Polish being: genitive, dative, accusative, instrumental and locative. I am using the term *words* rather than *nominals* to refer to the linguistic units prepositions combine with because in addition to unquestionable NP's, case-marked words in the Polish preposition-case combinations can also be adjectives (*po staremu*-DAT 'in the manner of old') or even adverbs (*do późna*-GEN 'till late')—for a brief discussion see Tokarski (1978:153–58).

[2] Temporal and figurative extensions of the 'movement-on-a-surface' use of *po*+LOC can be illustrated by the following examples: *Jan włóczy się* **po nocy**-LOC, *a w dzień śpi*, '*Jan wanders* **from place to place at night**, *and he sleeps during the day*'; *Różne myśli chodzą mi* **po głowie**-LOC, 'Various thoughts wander **about in my head**'.

[3] Other expressions with LOC *po* co-occurring with verbs denoting repeated contact with a body part (Weinsberg 1973:111 distinguishes such expressions as a separate group) include: *całować po rękach* 'kiss on the hands', *klepać po ramieniu* 'pat on the shoulder', *głaskać po policzku/ po włosach* 'stroke (sb.) on the cheek/ on the hair', etc.

[4] Weinsberg (1973:111) observes that if the locative preposition *w* is used instead of the locative *po* in examples containing verbs of disorder, the impression of chaos is optional.

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THE FUNCTION OF 'SUBJECT' IN LOCATIVE INVERSION CONSTRUCTIONS IN ENGLISH

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It has recently been proposed that the preposed constituent in so-called 'locative inversion' structures such as (1) below is in fact the syntactic subject of the clause (cf. Bresnan & Kanerva 1992:119–21; Bresnan 1994:115):

(1) Here comes trouble.

Various kinds of syntactic evidence are used to support this claim, such as Heavy-np-Shift, subject raising, tag formation and constraints on subject extraction (cf. Bresnan & Kanerva 1992:120–21), as well as the putatively topicalized status of the preposed np (Bresnan 1994:92). To be fair to Bresnan, it should be pointed out that in fact she makes a distinction between three different kinds of subjects in her tri-level model of grammar. On the level of argument structure, she distinguishes a logical subject, which in locative inversion constructions corresponds to the role theme (i.e., that of which location or change of location is predicated). The theme role is expressed by the postposed element *trouble* in (1) above. On the level of grammatical structure, where functional syntactic relations and attributes are established, she distinguishes a grammatical subject, which is associated with the discourse role of topic as well as with certain syntactic properties such as raising and extraction. The grammatical or syntactic subject in (1) corresponds to the preposed locative adverbial here. Thirdly, on the level of categorial structure, which has to do with the surface positions and forms of constituents, Bresnan speaks of a 'structural subject'. Sentence (1) above has no structural subject, as there is no element with the requisite np category in the subject position to the left of the vp, this position being occupied by the locative prepositional phrase.

I wish to argue in this paper that the analysis described above is based on an inadequate definition of the function of subject on all three levels. The latter cannot be defined as a universal category as Bresnan defines it, since linguistic categories involve a stable correspondence between a meaning and a linguistic sign. This immediately excludes both Bresnan's argument structure and her categorial structure as levels on which linguistic categories can be defined. The former is concerned exclusively with referential roles in complete disregard for how they are expressed by linguistic signs; the latter is concerned merely with the form and position of the sign in complete disregard of the meaning. This leaves the functional or grammatical structure, which is defined as corresponding to 'functional syntactic relations and attributes' such as person, number, gender, case, subject raising and subject extraction (Bresnan 1994:105). This level is however also defined exclusively in terms of concepts and relations which are 'inner' or 'covert' (Bresnan 1994:74), which means that they have no correlation with the way they are expressed by linguistic signs in a given language. On the contrary, if there is such a thing as a linguistic category of subject, it must first of all exist in a particular language and secondly it must involve a stable correspondence between sign and meaning in that language. I will now attempt to show that this is the case for English.

The term 'subject' will be used here to refer a word which stands in a relation to a finite verb such that:

(a) the word in question denotes the 'VERBING ENTITY' in the event expressed by the verb (thus *John* denotes the 'eating entity' in the sentence *John ate the custard*)
(b) the word in question has, or is replaceable by, one of the following forms: *I*, *you*, *he*, *she*, *it*, *we*, *they*
(c) if the verb is in the indicative mood, it shows third-person vs. non-third-person agreement (*-s* vs. Ø); if the verb is *be*, it shows first (*am*), third (*is*) or plural (*are*) agreement.

What justifies taking these as defining a linguistic category in English is that they involve a stable correlation between meaning and linguistic sign: if one has (b) and (c) on the level of the sign, one always observes (a) on the level of the meaning. It should be noted that (a) is defined in a more general way than the thematic role of AGENT, which does not correspond to the semantic status of the subject *John* in a sentence such as *John is tall* (cf. Keenan 1987:106). It is nonetheless obvious that John is represented as being tall by such an utterance, and so it meets the more general semantic criterion proposed here as having a correspondence to the linguistic sign in English.

If the above definition of subject as a linguistic category is applied to the preposed PP in locative inversion constructions which Bresnan claims to be the grammatical subject, it can be seen that this constituent fails to meet the definitory criteria for being an English subject on any count. Firstly, on the level of its meaning relation to the verb, it does not correspond to the VERBING ENTITY at all: in (1) above *here* is not understood to denote that which is coming, the latter being designated rather by the postposed noun. Second, the preposed prepositional phrase or adverbial is not replaceable by a subject pronoun (**It comes trouble*). Nor is the third criterion applicable either—subject-verb agreement; as pointed out by Schachter (1992:107) the verb in a locative inversion construction agrees with the postposed NP and not with the locative expression:

(2) a In the swamp was / *were found a child.
b In the swamp were / *was found two children.

The conclusion is clear: the locative expression is in no way a subject. The latter corresponds rather to the postposed NP.

The main reason why Bresnan proposes that the postposed NP is not the subject in locative constructions is because it is associated with the discourse function of focus. These constructions are seen as having 'a special discourse function of presentational focus… in which the referent of the inverted subject [sic] is introduced on the scene' (1990:13). Within this discourse structure, the preposed locative has the role of topic—it sets the scene and therefore constitutes presupposed information—while the postposed NP introduces an entity onto this scene, and so represents the new information or focus. Although I can agree with the essence of this view as to the information structure of locative inversions, the assumption that a subject cannot function as a focus seems entirely unwarranted. As Birner's work on inversion suggests, discourse-familiarity correlates not with subjecthood but rather with relative sentence position, at least in canonical word order and inverted constructions, with discourse-old information tending to precede discourse-new information (1996:6, 141). Even here, however, caution must be exercised, as it has been recognized since Jespersen's times (1924:145) that in English, even in sentences with so-called canonical word order, first position does not always correspond to the topic, as shown by (3):

(3) – *Who* said it?
– *Peter* said it.

Here the subject *Peter* occupies first position and nevertheless in this context provides new information. This shows that the packaging of information in a text is to a certain extent independent of the grammatical relations holding between the constituents making up the text. If the non-isomorphic nature of information structure and grammatical structure is recognized, the fact that the subject of a locative inversion construction has the information function of focus rather than topic is no impediment to its being a grammatical subject at all.

The two levels are not completely autonomous of one another however and there are certain cases where the presence of a grammatical subject in a locative inversion construction does appear problematic, with the possibility of a change in the grammatical relations between the constituents of the sentence being due to the peculiar discourse function of this construction. Birner (1996:150) observed that in 1% of the utterances in her corpus of inversions (21 occurrences out of 1778) the verb does not agree with the postposed NP but rather occurs in the third person singular form even when the postposed phrase is plural. This is illustrated in (4) and (5):

(4) The office isn't so big but pretty crowded. Usual things, ledgers, files and docket books. On the wall *is* two Winchester rifles, a Savage high-powered weapon and a shotgun.
(Birner 1996:14)

(5) On the title page of this report of this 'Grossaktion', as the Germans called it, *was inscribed* in decorative Gothic lettering the words 'there are no more Jewish dwellings in Warsaw'.
(Hartvigson & Jakobsen 1974:60)

Also associated with these uses involving lack of verbal agreement is the occurrence of the common case form of the pronoun, as noted by Lambrecht (1994:42) regarding (6) and by Bresnan (1994:86) regarding (7):

(6) Look, here's me!

(7) Among the guests of honor was sitting her. [pointing]

The criteria proposed here for determining English subjecthood lead to the conclusion that the postposed nominal is not the subject in these cases: although the semantic criterion is met, neither of the criteria on the level of the sign are satisfied.

This indeed is the analysis which I wish to defend. I will submit that in sentences (4)–(7) what we have in fact is a subjectless presentational construction. This construction is composed of three parts:

(a) a locative expression which sets a scene or defines a situation
(b) a verb whose primary function is to denote the existence or appearance of some entity on this scene or in this situation
(c) a nominal which provides the identification of the entity situated on the scene.

Given the way the speaker puts together the notions making up this construction, the verb can be conceived as merely evoking the existence/appearance of some yet to be identified entity on the scene set by the preposed locative. This would explain why in some cases it is conjugated in the third person singular regardless of the person and number of the postposed NP. Just as the verb is conceived independently of what could have been its subject, so also the nominal is conceived independently of what could have been its verbal predicate. As a consequence, one finds the same pronominal forms here as in uses where the pronoun is completely independent of any relation to a verb such as (8):

(8) – Who ate all the cookies?
– Me.

This brings out the tight symbiotic relationship which exists between a verb and its subject in English, whereby the form of the verb shows that its mental genesis is based on the person/number of the subject, and the form of the subject shows that its mental genesis takes into account its role with respect to the verb. The nature of the locative inversion construction causes this symbiosis to be broken in a certain number of cases, with the verb being thought independently of the postposed NP and the latter being thought independently of the verb. Since the breaking of this relationship is signified by the linguistic sign in English, we are justified in sustaining that the postposed NP in these cases no longer corresponds to the linguistic category of English subject.

To show that these considerations can be extended to other constructions, I would like to end this paper by taking a cursory look at so-called existential-*there* sentences. What is noteworthy here is the fact that, particularly in colloquial English, we find the same tendency to have no verbal agreement in *there*-sentences as was observed with locative inversion, as pointed out by Quirk et al. (1985:1405):

(9) There's some people in the waiting room.

Moreover, when pronominal forms are used, they occur in the independent form, as in the 'list use' of *there*-sentences, which allow definite NPs, as illustrated by Rando and Napoli's (1978:308) examples:

(10) A. My God! How many people know about this?
B. There's me and there's you. That's all.

(11) A. I don't have any friends.
B. Oh, don't be silly! There's John and me and Susan and Peggy…

These facts suggest that the existential-*there* construction is also often conceived as a subjectless presentational structure. This would provide a further piece of evidence against analyzing *there* in its existential use as the subject of the sentence even in cases where it appears to command verbal agreement, being used in the third person singular form as in (9)–(11). In actual fact, as we have seen occurs in certain locative inversion constructions, the verb here is conceived independently of the postposed NP as merely evoking the existence of some yet to be identified entity in the locus evoked by *there*, which explains its occurrence in the third person singular.

Of course, there still remain problems to be addressed with respect to this analysis of existential *there*, such as its inverting with the verb in interrogative utterances.

Nevertheless, the views presented here seem capable of both explaining the curious parallels between locative inversion and existential-*there* constructions and accounting for the confusion surrounding the identification of the subject with both constructions as well.

The approach taken here has been based on a definition of 'subject' as a category involving a correlation between meaning and linguistic sign. That is why I have not used the term 'subject' in the cases where this correlation is not observed, such as (4)–(7) and (9)–(11) above. I am aware that some analysts would propose to treat the postposed NPs in these cases as subjects which do not exhibit all the features typical of this function. However, this amounts to adopting a purely notional definition of this category which abstracts away from the bond between meaning and sign. The term 'subject' itself makes it easy to be led into this temptation: it is applied to a wide variety of things in various languages, as shown by Keenan (1987). If this term is to be used as a linguistic rather than a logical category however, it must be defined within the framework of each natural language as a stable correlation between meaning and linguistic sign. This allows one to see what a given language treats as different and what it treats as the same. The observations made in this paper show that, outside of the information-packaging function of topicality, English treats the preposed element *here* in (1) above completely differently from that in *Here is fine, if you want a place to sit*. In the latter case the preposed element shows a correlation between the semantic criterion of being represented as 'being fine' and the semiological criteria of corresponding to a subject pronoun and commanding verbal agreement, and consequently satifies the definition for being a subject in English. Abstracting away from the semiological criteria for subjecthood on the other hand would even license calling the possessive *his* in *his arrival* a subject. While the problem which this type of definition of subjecthood poses is perhaps less obvious with locative inversions, I hope to have shown that the semiology is essential for determining how the grammatical relations are established in this construction as well.

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EXTERNAL POSSESSION IN HEBREW

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Functional linguists have used external possession (or EP) to refer to 'any construction in which a semantic possessor-possessed relation is expressed by coding the possessor as a core grammatical relation of the verb, and in a constituent separate from the one that contains the possessed item…' (Payne 1997:vi). EP constructions are varied and plentiful crosslinguistically. (See Barshi & Payne 1996 for Maasai examples; Chappell 1998, for Chinese; Tuggy 1980 for Spanish.) Body parts as possessed items are universally allowed in EP constructions; some languages will not permit EP unless the possessed is inalienable, while others allow alienable possessions as well. (See Chappell 1998.) The EP construction is generally perceived as an unusual departure from the 'normal' or 'more direct' method of employing a possessive pronoun to express the relation between possessor and possessed. This paper will show that EP in Modern Hebrew is not a departure from the usual method of expressing possession; on the contrary, EP is an integral part of the possessive system. The semantics of indirect impact is basic to the concept of possession as coded throughout the language.

The EP construction in Modern Hebrew involves a noun whose possession by another nominal is indicated by the dative preposition *l-*. Externally possessed nominals can be either the subject or the object. They do not have to be inalienable, nor does the expression need to have an adversative effect. Whether the connotation is benefactive or adversative depends on the semantics of the verb. What they all have in common is that the possessor is indirectly affected by what happens to the possessed. The nominal so marked may consist of a full noun (as in (1)a below) or the preposition plus a pronominal suffix (2)a. The externally possessed noun can be either the subject (2)a or the object (1)a of the verb.

(1) a. Hu šavar **le**Yoram et haregel. [EXTERNAL POSSESSOR]
he broke to-Yoram D.O. the-leg הוא שבר ליורם את הרגל
'He broke Yoram's leg'

b. Hu šavar et haregel šel Yoram. [OVERT POSSESSOR]
he broke D.O. the-leg of Yoram הוא שבר את הרגל של יורם
'He broke Yoram's leg'

(Note that *l-* is affixed to nouns, but appears independently as a separate word with pronominal affixes.)

(2) a. Nafla **li** šen. [EXTERNAL POSSESSOR]
fell to-me tooth נפלה לי שן
'My tooth fell out.' ('I lost a tooth.')

b. Hašen šeli nafla [OVERT POSSESSOR]
the-tooth of-me fell. השן שלי נפלה
'My tooth fell out.'

The use of the external possessor in examples (1)a and (2)a above is the normal, unmarked mode of expression, but is not by any means exclusive. If the overt possessive pronoun in (1)b is used, it would mean that the speaker is somehow more interested in Yoram's leg and its fate, than in Yoram as a person. By the same token, the possessive pronoun (2)b would imply that there was some significance to the tooth, that the hearer knows which particular tooth fell out and that the identity of the tooth is more important than the fact of the speaker's loss. The sentient or non-sentient status of the externally possessed nominal in some measure determines markedness. Example (3)a with its overt possessive suffix is the normal, impartial way of announcing the death of the son of acquaintances. The use of EP in (3)b indicates that the speaker is focusing on the suffering of the parents, rather than on the death of the son. As an epiphenomenon of this markedness effect, (3)b also has a strong adversative connotation.

(3) a. Bnam met. [OVERT POSSESSOR]
son-of-them died בנם מת
'Their son died.'

b. Met **lahem** haben. [EXTERNAL POSSESSOR]
died to-them the-son מת להם הבן
'Their son died (on them).'

So far, what we have seen conforms to the prototypical instantiation of EP in a given language. Many languages stop here. Chappell (1998:20) concludes that in Sinitic languages, the EP construction encodes a relationship of inalienable possession and that the category of kin is peripheral, in that its use is restricted to the verb 'to die' and its synonyms.

In Hebrew, nouns capable of external possession are not limited to body parts, or kinship terms, although those are the most common. The semantics of the preposition *l-* is that of affectedness, and lesser degrees of connection between the possessor and the possessed are possible.

(4) Hargu **lanu** et roš hamemšala. הרגו לנו את ראש הממשלה
killed(3RD-PL) to-us D.O. head the-government
'They killed our prime minister.'
('Our prime minister was killed.')

The area of affectedness can be seen as the sphere of interest of the party affected. In (4) above, the speakers' personal stake in the fate of their country's political leader is the trigger for use of the construction. In (5) below, the parties are affected by what happens to the street on which they live. No very strong emotional tie or devastating effect is required.

(5) Sagru **lahem** et harxov. סגרו להם את הרחוב
Closed(3RD-PL) to-them D.O. the-road
'Their street got closed off.'
(They closed to them the street.)

In all of the examples of EP so far, there has been a strong adversative effect. This is a common feature of sentences involving External Possession. In Sinitic languages, the effect must be both adversative and marked. A body part must be damaged, and the dysfunction must be more than a passing effect. (Chappell in 1998:20). However, in Hebrew there is no requirement that loss be involved. Beneficial services performed may be described using an external possessor, as in (6).

(6) Hi tsixtsexa **li** et hašinayim. היא צחצחה לי את השניים
She brushed to-me D.O. the-teeth.
'She brushed my teeth.'

The semantics of external possession is not an isolated and unusual aspect of the Modern Hebrew grammar. The meaning of affectedness is coded into the preposition *l-* in every instance of its use. The normal dative/benefactive interpretation signalling 'giving' comes more from the semantics of the benefactive verb than from that of the preposition.

(7) a. Natati **lo** banana. נתתי לו בננה
gave(1ST-SG) to-him banana.
'I gave him a banana.'

b. Laqaxti **lo** banana. לקחתי לו בננה
took(1ST-SG) to-him banana
'I took a banana away from him.'

(7) c. Laqaxti mimenu banana לקחתי ממנו בננה
took(1ST-SG) from-him banana
'I took a banana from him.'

d. Laqaxti **lo** et habanana לקחתי לו **את** הבננה
took(1ST-SG) to-him D.O. the-banana
'I took his banana.'

Thus (7)a indicates a beneficial recipient status to the participant marked with *l*-, while in (7)b an adversative loss effect is achieved, because the verb indicates 'taking' rather than 'giving'. The default assumption about the effect of 'giving' is that the outcome is good. The default assumption with 'taking' is that the outcome is bad. In order to overcome the default negative assumption about taking, another preposition has to be used. So it is that in (7)c the consent of the owner is implied by the use of *min*, a preposition indicating source or origin. By focusing on the possessor as the source rather than the one affected, we imply that he suffered no ill effect from the taking. Lastly, if we mark the possessed as definite as in (7)d, yet have not mentioned it in discourse, then the assumption is that the possessed belongs to the one affected.

If no other reason in the discourse has caused us to focus on that particular banana before, then the only possible reason for the definiteness would be that it belonged to the person affected. In turn, this would also explain why he is affected by the taking. When these two implicatures reinforce each other, there arises an unmistakable interpretation that the banana is the property of the affected party.

The above analysis is consonant with all usages of the preposition *l*-, including those with the existential copula. Hebrew does not have a verb 'to have'. Something belongs to the one who is most affected by its existence.

(8) Yeš **li** kelev. יש לי כלב
Is to-me dog.
'I have a dog.'

Instead of being an isolated and unusual phenomenon, external possession in Hebrew is a normal part of the notion of indirect impact. Many of the most basic expressions of ownership or possession are coded by specifying who is affected by what happens to the possessed nominal. Even the independent possessive pronouns were historically derived from the indirect object marker *l*-. See (9) below.

(9) ORIGIN OF INDEPENDENT POSSESSIVE PRONOUNS AND PARTICLE

ašer l-	‘which is to’	→	šel	‘of’
ašer li	‘which is to me’	→	šeli	‘my’
ašer lexa	‘which is to you (M.SG)’	→	šelxa	‘your (M.SG)’
ašer lax	‘which is to you (F.SG)’	→	šelax	‘your (F.SG)’
ašer lo	‘which is to him’	→	šelo	‘his’
ašer la	‘which is to her’	→	šela	‘her’
ašer lanu	‘which is to us’	→	šelanu	‘our’
ašer laxem	‘which is to you (M.PL.)’	→	šelaxem	‘your (M.PL)’
ašer laxen	‘which is to you (F.PL.)’	→	šelaxen	‘your’(F.PL.)’
ašer lahem	‘which is to them (M.PL)’	→	šelahem	‘their’(M.PL.)
ašer lahen	‘which is to them (f.pl)’	→	šelahen	‘their’(F.PL.)

The independent possessive pronouns in Hebrew are a relative innovation. They appear in the Old Testament in only three verses, all in the Song of Songs. (Even-Shoshan 1992:1097.) The progression from *ašer l-* to *šel* appears to have been preceded by the contraction of *ašer* to *š-*, thereby paving the way for a resyllabification in the case of the use of *l-* with pronominal suffixes.

Having established then that the EP construction and the independent pronouns are not entirely unrelated, we may now explore the nature of that relationship with a view to comparison with other EP languages. In Sinitic languages, according to Chappell, ‘it is difficult to uphold a derivational relationship between the two construction types since they serve different discourse functions and display distinct constructional semantics’ (1998:19).

What then is the relationship between the EP method of encoding possession and the use of independent possessive pronouns in Hebrew? Does EP derive from the independent possessive pronouns? Decidedly not. The use of EP actually draws on an older strain in the language, one under which all possession is seen as a form of affectedness. Do the independent pronouns derive directly from EP? No. EP is a spreading innovation: the older Biblical forms made use of the possessive pronominal endings, affixed to the possessed. What we have instead is an innovation that bypasses another innovation returning us to a stage that is more like its predecessor—though by no means identical.

Chappell notes the semantic difference between the normal genitive construction in Sinitic and its EP counterpart. Besides the issue of inalienable possession and an adverse effect, the EP construction in Sinitic casts the possessor as an experiencer. This is considered a significant semantic criterion.

In Hebrew, also, the EP construction emphasizes the possessor’s point of view as an experiencer. Possessor as experiencer was the metaphorical base for the use of the existential copula as a means of encoding possession in pre-Biblical Hebrew. This in turn led to the formation of the independent pronouns in late Biblical Hebrew and beyond. By the time the reanalysis of *ašer l-* to *šel* was complete, the semantic connection to affectedness was lost, and the morphemes became opaque, serving as formal grammatical markers of possession.

Speakers, feeling the need to express possession as affectedness, since this viewpoint is woven into the fabric of the language, revived the use of *l-* and recreated a form of expression that, in terms of possessive marking, had almost died out.

The relative vividness of EP semantics as compared with that of conventional genitive expressions is therefore, at least in Hebrew, not an indication that the two are entirely unrelated. Instead, it is a demonstration of semantic bleaching at play and a showcase for the strategies that speakers employ to retrieve lost meaning from aging grammatical forms. Likewise, we see that the language as a whole, while undergoing many changes in form and function, manages to maintain an equilibrium of sorts, in terms of its basic semantic framework. Even when an independent pronoun is used in a non-EP construction, the hidden strategy of the language still involves indirect or external possession. While the historical development outlined above has become opaque to speakers, the drive to find fresh ways to code possession as affectedness makes novel EP constructions appear spontaneously in everyday speech.

Possession in Hebrew is a natural outgrowth of indirect affectedness. Expressions of external possession are basic to the semantics of indirect impact as coded throughout the language.

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ON THE BOUND VARIABLE INTERPRETATION OF PRONOUNS AND ANAPHORS

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A pronoun cannot function as a variable bound by a wh-phrase in Korean data (1), whereas in the corresponding English sentence (2) such a reading is readily possible.

(1) *nwu$_i$-ka ku$_i$-uy chinkwu-lul pinanhayssni?[1]
who$_i$-Nom he$_i$-Gen friend-Acc criticized
'Who$_i$ criticized his$_i$ friend?'
(2) Who$_i$ criticized his$_i$ friend?'

The ungrammaticality of data (1) cannot be accounted for by any of Chomsky's (1981) three principles of Binding Theory, which should govern the interpretation and distribution of nominal expressions.[2] This critical exception to Chomsky's Binding Theory was not given much attention in the relevant literature, and as far as I know, Montalbetti is one of the few linguists who attempted to explain the contrastive pattern shown in data like (1) and (2) within the Government and Binding (GB) framework.

Montalbetti (1984) would explain the contrast between (1) and (2) through his Overt Pronoun Constraint (OPC). OPC basically prohibits a bound variable interpretation of an overt pronoun if the empty pronoun *pro* is available in the same position. Therefore, in pro-drop languages like Korean and Japanese, since *pro* is available in almost all nominal positions for a bound variable interpretation, an overt pronoun may never be interpreted as a bound variable, which accounts for the Korean data (1). According to Montalbetti, since English is not a pro-drop language the overt pronoun can be used as a bound variable, as in the English data (2).

However, as can be seen in some of the examples below, for many native speakers of Korean (including myself), an overt pronoun can be used as a bound variable contra what Montalbetti predicts.

(3) a. * motwu$_i$-nun kunye$_i$/ku$_i$-ka ttokttokhata-ko sayngkakhanta
everyone-Top she/he-Nom intelligent-Comp think
'Everyone thinks that she/he is smart.'

(3) b. *motun cikwen$_i$-un kunye$_i$/ku$_i$-ka ttokttokhata-ko sayngkakhanta
every employee-Top she/he-Nom intelligent-Comp think
'Every employee thinks that she/he is smart.'
c. motun yepise$_i$-nun kunye$_i$-ka ttokttokhata-ko sayngkakhanta
every female secretary-Top she-Nom intelligent-Comp think
'Every female secretary thinks that she is smart.'
d. motun namhaksayng$_i$-un kui-ka ttokttokhata-ko sayngkakhanta
every boy-Top he-Nom intelligent-Comp think
'Every boy thinks that he is smart.'

(4) a. *nwu$_i$-ka kunye$_i$-uy pwumo-lul yanglowen-ey ponayssni?
who-Nom she-Gen parents-Acc nursing home-to sent
'Who sent her parents to a nursing home ?'
b. *nwu$_i$-ka ku$_i$-uy pwumo-lul yanglowen-ey ponayssni?
who-Nom he-Gen parents-Acc nursing home-to sent
'Who sent his parents to a nursing home?'
c. etten yeca$_i$-ka kunye$_i$-uy pwumo-lul yanglowen-ey ponayssni?
which woman-Nom she-Gen parents-Acc nursing home-to sent
'Which woman sent her parents to a nursing home?'
d. etten namca$_i$-ka ku$_i$-uy pwumo-lul yanglowen-ey ponayssni?
which man-Nom he-Gen parents-Acc nursing home-to sent
'Which man sent his parents to a nursing home?'

A similar pattern can also be found in the following Japanese data for the native speakers that I consulted.[3]

(5) Japanese
a. *daremo$_i$-ga kanojoi/kare$_i$-ga kasikoito omotteiru
everyone-Nom she/he-Nom smart think
'Everyone thinks that she/he is smart.'
b. *dono gakusei$_i$-mo kanojoi/kare$_i$-ga kasikoito omotteiru
every student-Nom she/he smart think
c. dono syojo$_i$-mo kanojo$_i$-ga kasikoito omotteiru
every girl-Nom she smart think
d. dono syonen$_i$-mo kare$_i$-ga kasikoito omotteiru
every boy-Nom he smart think

In the (c) and (d) examples of (3)–(5), the bound variable interpretation ofthe overt pronouns is acceptable, whereas it is not permitted in the (a) and (b) examples. It is not clear how this fact can be captured by Montalbetti (1984). Since Korean and Japanese are pro-drop languages according to him, the bound variable interpretation of the overt pronouns should be prohibited in the (c) and (d) examples just like in the (a) and (b) examples due to the availability of the empty pronoun *pro*. Another problem with OPC is that it does not provide a fundamental explanation for the (un)availability of bound variable interpretation of pronouns since it is merely an *ad hoc* stipulation.

In this paper, I will attempt to give a proper generalization that captures the above data and yields the right results. I will argue that the account proposed in the present work can derive a reasonable explanation for the (un)availability of bound variable reading of pronouns from Chomsky's Binding Theory without an extra stipulation, if Lasnik's (1991) version of Principle C is adopted (see note 2).

1. REFERENTIALITY AND BOUND VARIABLE INTERPRETATION OF PRONOUNS. As one can see in the above data, whether the overt pronouns can function as a bound variable or not seems to depend upon what type of wh-phrase or quantifier phrase binds them. For the (un)acceptable examples of data (3) through (5), if their relative (un)acceptability centers upon some unique relation between a binder (wh-phrases/quantifier phrases) and a bindee (pronouns), the question is what the exact nature of the relation between the two is that allows some sentences and rules out others. I propose that this relation should be characterized as relative referentiality between the binder and the bindee, and suggest that Lasnik's (1991) prohibition against binding a more referential expression by a less referential one may be the underlying assumption behind the existence of the bound variable reading of pronouns.[4] Then, with the prohibition, a correlation between such a reading and referentiality can be established as:

(6) Between a binder (wh-phrases/quantifier phrases) and a bindee (pronouns) A and B, if A binds B, then B cannot be more referential than A.

The above condition is a paraphrase of Lasnik's prohibition, and what it predicts is that any sentence in which the bindee is more referential than the binder should fail to yield a bound variable reading. Now the crucial question about condition (6) is how to define referentiality. Following Lee (1997), I propose that the amount of phi-features (person, number, and gender) that nominal expressions carry can determine relative referentiality of two nominal expressions in a binding relation.[5] With the addition of this definition of referentiality, (6) can be rephrased as (7):

(7) Between two nominal expressions A and B, A is regarded as more referential than B if and only if A has more lexical content (phi-features: gender, person, number) than B. Mark any representation as ungrammatical (with a *) if it contains two nominal expressions A and B such that A binds B, if B (bindee) is more referential than A (binder). A binds B if A is coindexed with B and A structurally antecedes B.

Now let us briefly consider how condition (7) may account for data (3), (4), and (5). For the unacceptable (a) and (b) examples, the bindees (pronouns) are more referential than the binders (wh-phrases or quantifier phrases) according to the notion of referentiality given in (7). On the other hand, in the case of the acceptable (c) and (d) examples, the bound pronouns are not more referential than the binding expressions in terms of the amount of phi-features. To put the account into more specific terms, in (3)a and (3)b, the binders *motwu* ('everyone') and *motun cikwen* ('every employee') have only person and number features with the gender feature unspecified, and the bindees *kunye* ('she') and *ku* ('he') are fully specified in all phi-features. Therefore the two sentences can be correctly ruled out according to (7) since *motwu* and *motun cikwen* (3rd, singular) bind more referential *ku* and *kunye* (3rd, singular, female), which have more phi-features. In acceptable (3)c and (3)d, the binders *motun yepise* ('every female secretary') and *motun namhaksayng* ('every boy') are fully specified in all phi-features like the bindees *kunye* and *ku*, therefore condition (7) is not violated. In unacceptable (4)a and (4)b, the binder *nwu* ('who') is specified in person and number features only (3rd, singular) with the gender feature unspecified whereas the bindees *kunye* and *ku* are fully specified in all features, hence the violations of condition (7). Analogous accounts can be provided for acceptable Korean data (4)c and (4)d, and Japanese data (5).[6]

The proposed account of the foregoing data clearly shows that relative referentiality between binder and bindee plays a significant role in determining whether or not the overt pronouns can be interpreted as a bound variable. The above data also show that if an overt pronoun is bound by a relatively referential wh-phrase/quantifier phrase, it may function as a bound variable unlike what Montalbetti's (1984) account would predict.

This observation based upon the relative referentiality between binder and bindee is a valid one, because in the unacceptable a and b examples of (3), (4), and (5), if the overt pronouns are replaced with featureless *pro* or Korean anaphor *casin* ('self') and Japanese *zibun* ('self'), the unacceptability disappears. This indicates that the non-referential *pro* and anaphor may always function as bound variables. That *casin* and *pro* are featureless and non-referential since they are unspecified in person and gender features can be seen in the following data showing that they can take any gender and person antecedents.[7]

(8) na$_i$/ne$_i$/ku$_i$/kunye$_i$-nun casin$_i$-uy/pro$_i$ emeni-lul cal tolpoassta.[8]
I/you/he/she-Top self-Gen/pro mother-Acc well took care of
'I/You/He/She took good care of my/your/his/her mother.'

2. Some Apparent Problems. The English pronoun *he/his* can be freely interpreted as a bound variable in (9) as in (2) above.

(9) a. Who$_i$/Which person$_i$ loves his$_i$ mother?[9]
b. Who$_i$/Which kid$_i$ did you say likes his$_i$ teacher?
c. Everyone$_i$/Every student$_i$ loves his$_i$ mother.
d. Everyone$_i$/Every employee$_i$ thinks that he$_i$ is smart.

Then the question is why condition (7) is inoperative in the English data. In (2) and (9), even though condition (7) is violated, the data are all acceptable and the bound variable interpretation of the pronouns is possible in all the sentences of (9) and (2). So the question is why there is a difference between English and Korean/Japanese in the application of condition (7). However, whether there exists such a difference between English and the other two languages may not be so obvious, if we consider the following English data.

(10) a. Everyone$_i$ thinks that she$_i$ is smart.[10]
b. [3rd, sg.]$_i$ ——— [3rd, sg. female]$_i$
(11) a. Every woman$_i$ thinks that she$_i$ is smart.
b. [3rd, sg. female]$_i$ ——— [3rd, sg. female]$_i$
(12) a. Everyone$_i$ thinks that he$_i$ is smart.
b. [3rd, sg.]$_i$ ——— [3rd, sg.]$_i$
generic

In (10)a and (11)a, unlike the data in (9) and (12)a where the pronoun *he* is used, *she* is used instead. Eight out of the nine native speakers that I consulted agree that even though in (11)a and (12)a the bound variable interpretation of the pronouns can be easily derived without specific discourse contexts, in (10)a the same interpretation is not readily available if the sentence is uttered without some pragmatic contextual cues. For many native speakers, there is a contrast between (10)a and (12)a, in terms of the availability of the bound variable interpretation of the pronouns, if the sentences are shown out of context. This difference may be due to the fact that *he* is genericized in its usage whereas this is not the case for *she*. If *he* is generic (gender unspecified), then it could be a gender-neutral third person pronoun, whereas the non-genericized *she* should always be gender-specific.

Given this assumption, the contrast between (10)a and (12)a can be explained in the following manner. In (10)a the bound interpretation may not be derived because *everyone* binds the more referential *she* as shown in (10)b, whereas in (12)a the bindee, generic *he* (gender-neutral), is not more referential than the binder *everyone* as shown in (12)b, which accounts for the fact that the bound interpretation is readily available even without pragmatic contexts. Such being the case, we may claim that condition (7) may be operative even in English data (2), (9), and (10)–(12). Therefore it may be the case that there is no difference between English and Korean/Japanese in the application of condition (7).

Nevertheless, two questions still remain to be answered. First, a sociolinguistic account should be given as to why the same type of genericization does not take place for Korean pronoun *ku* ('he') unlike its English counterpart. Second, it is not yet clear precisely under what linguistic contexts English pronoun *he/his* can or cannot be genericized.

3. SUMMARY. In this paper, I attempted to predict the (un)availability of the bound variable reading of pronouns by using the notion of referentiality. I established the relation between the bound reading and referentiality as:

> Between two nominal expressions A and B, A is regarded as more referential than B if A has more lexical content (phi-features) than B. Mark any representation as ungrammatical (with a *) if it contains two nominal expressions A and B such that A binds B, if B is more referential than A.

The underlying assumption behind this relation was Lasnik's (1991) prohibition against the binding of more referential expressions by less referential ones. Lasnik (1991) regards this prohibition as a universal condition that holds true crosslinguistically, and argues that Chomsky's (1981) Principle C of Binding Theory can be derived from it (see note 2). If the universal condition can be interpreted as Principle C as he argues, it means that Chomsky's Binding Theory may be enough to explain the above data without any additional stipulation.[11] Montalbetti's (1984) OPC was an extra stipulation that must be postulated in addition to the three binding principles, and it is obvious that this would make the overall Binding Theory more complicated and unreasonable. Given that Lasnik's prohibition underlying the relation between the bound reading and referentiality can be adopted as Principle C, the account proposed in this paper explains the (un)availability of bound variable interpretation of pronouns without resort to such an extra stipulation, thus keeping the Binding Theory as simple as before but with much more explanatory power.

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[1] The following abbreviations are used in this paper: Top = topic marker; Comp = Complementizer; Nom = nominative case marker; Gen = genitive case marker; Acc = accusative case marker; sg = singular; *(asterisk) = ungrammatical or unacceptable.

[2] Chomsky's (1981) three principles of Binding Theory are the following:
(i) Principle A: A reflexive pronoun must be A-bound within its local domain (the smallest clause that contains it).
(ii) Principle B: A pronoun must be A-free within its local domain (the smallest clause that contains it).
(iii) Principle C: A referential expression must be A-free.

Principle A and C are irrelevant to data (1). (1) does not violate Principle B since Korean pronoun *ku* is A-free even though it is A-bar bound by *nwu* ('who'). For theoretical details, interested readers should look at Harbert (1995) and references cited therein.

[3] I asked seven native speakers of Japanese for their judgement on the data in (5). The general pattern was the same for all of them.

[4] Lasnik (1991) proposed a referential hierarchy among R-expressions, pronouns, and anaphors (R-expression > pronoun > anaphor) on the basis of the universal condition that a less referential expression cannot bind a more referential one. For details, see Lasnik (1991).

[5] In Lee (1997), I proposed a referential hierarchy of anaphoric nominals in Korean and argued that the varying degrees of long distance binding effects which different anaphoric expressions show correlate with the relative referential hierarchy established among them. I determined the hierarchy primarily by phi-features anaphoric nominals carry. For the relation between referentiality and phi-features, see Lee (1997) and references cited therein.

[6] Condition (7) cannot account for the availability of bound variable reading of the pronoun in English data (2). See section 3 below for this problem.

[7] Some speakers agree that even though there is a clear contrast between (3)a and (3)b on one hand, and (3)c and (3)d on the other hand, there may be an additional contrast inside (3)c and (3)d. In other words, in (3)c and d if *pro* or *casin* replace the overt pronouns *kunye* or *ku*, their judgement on the data improves from marginal to perfect. The same pattern may hold for the Japanese data (5)c and (5)d, in addition to the clear contrast between unacceptable (5)a and (5)b and acceptable (5)c and (5)d noted by the seven native speakers I consulted. The slight contrast some native speakers detect between *pro/casin* and the overt pronouns in (3)c and (3)d may be explained by another generalization that the wider the referential gap between two nominal expressions A (binder) and B (bindee), the more acceptable the binding relation is. In other words, binder may have to be maximally referential whereas bindee may have to remain minimally referential with respect to its binder. Taking (3)d for example, the referential gap between *motun namhaksayng* ('every boy'; binder) and *pro/casin* (bindee) may be substantially wider than that between *motun namhaksayng* (binder) and *ku* ('he'-bindee). Therefore, the former binding relation may be better in acceptability than the latter binding relation to some speakers. As far as my judgement is concerned, there is no contrast between the two binding relations, as there is no contrast between *pro/casin* and the overt pronoun in (4)c and (4)d.

[8] Some native speakers, including one reviewer of this paper, noted that possessive *casin* is very awkward with 1st and 2nd person pronouns. For English, it simply does not have a reflexive possessive.

[9] I would like to thank the native speakers in the department of English and department of East Asian Studies at Korea Maritime University for their judgements on the English, Korean, and Japanese data used in this paper.

[10] One reviewer noted that *everyone* is not necessarily singular in the sentence, *Everyone waved at the returning astronaut and he waved back at* THEM. He also added that for most native speakers of American English *he* is not generic.

[11] For detailed arguments for adopting the universal condition as Principle C, See Lasnik (1991) and references cited therein.

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TOPIC PROMINENCE AND GRAMMATICAL RELATIONS IN KOREAN

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This paper is intended as a contribution to the now venerable work on the concept of topic prominence by Li and Thompson (1976). Specifically, we will claim that the kind of dual subject- and topic-prominence found in languages like Korean results in the rarity of grammatical relations changing rules like passivization and raising, and to more semantically defined grammatical relations generally.

Li and Thompson (ibid) established the notion that a 'topic prominent' language type must be distinguished from the 'subject prominent' type that predominates in the well-known European languages. Topic-prominent languages are said to be characterized by a distinct grammatical topic constituent, with the main sentence division being between this topic and the remaining comment. This contrasts with the division between a grammatical subject and its predicate in subject-prominent languages. According to Li and Thompson (ibid:483), these two language types form the end points of a typological continuum, with highly topic-prominent languages like Lisu and, to a somewhat lesser degree, Chinese located close to the topic-prominent ideal, while English, French or Indonesian cluster close to the subject-prominent ideal. Other languages investigated by Li and Thompson, such as Malagasy or Philippine languages, occupy intermediate positions on this typological scale.

In this paper, we will focus on a type of language which is both, highly subject-prominent and highly topic-prominent. We will henceforth refer to such subject-cum-topic prominent languages as 'dual prominence' languages. Though mentioned in Li and Thompson's article, dual prominence languages stand outside the typological continuum described in the preceding paragraph and little work is available on the consequences of this dual prominence. Li and Thompson (ibid) sketch the position of this language type as in Figure 1.

1. Subject and Topic in Korean. Korean, as well as Japanese, is a prime example of a language with distinct subject and topic constituents, as (1) illustrates:[1]

(1)	Il	nyen	ceney-nun	Kiyong-i	Yunsoo-lul	ttayli-ess-ta.
	one	year	before-TOP	Kiyong-NOM	Yunsoo-ACC	hit-PAST-DEC

'A year ago, Kiyong hit Yunsoo.'

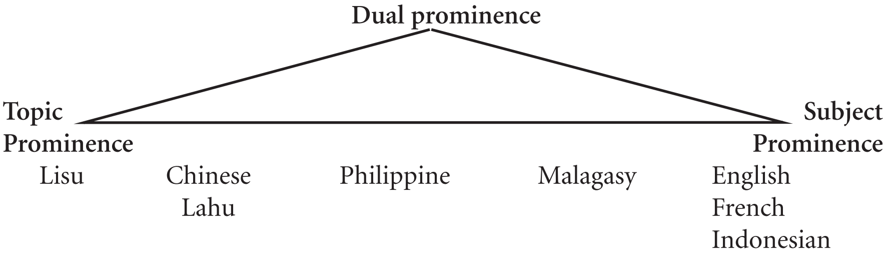

Figure 1. (adapted from Li & Thompson 1976:483)

Notice that the grammatical roles of the various participants are identified by grammatical particles in Korean, including distinct particles for subject and topic: Subjects are marked by *-i* (after consonant) or *-ka* (after vowel) while topics are marked by *-(n)un*, with the same morphophonemic alternation. Any of the participants in the sentence can become topic by assuming *-(n)un* marking and moving to the initial position. Notwithstanding the fact that there are sentences without either a surface topic or subject, languages like Korean can therefore be said to be both subject- and topic-prominent.

Li and Thompson limit their comments on dual prominence to its hypothesized position in the diachronic development of languages. Claiming that 'subjects are essentially grammaticalized topics', they view dual prominence as a stage in a diachronic drift at which a grammaticalized topic is 'being integrated into the case frame of the verb' (ibid:484).

The question here, of course, is what kinds of phrases become coded as subjects in such languages. It is certainly not the case that all kinds of topics, with all kinds of semantic relationships to the verb, will find the emerging subject relation equally accessible; rather, as we shall demonstrate for Korean, phrases with certain semantic roles—most prominently agents—are preferentially coded as subjects. The reason for this unequal accessibility to subjecthood lies in an important omission in Li and Thompson's characterization of subjects, i.e., that subjects, in reality, are not just 'grammaticalized topics' but rather the grammaticalized relation of both topics and agents (Comrie 1989). Prototypical subjects, therefore, are constituents which are agents as well as topics. Indeed, agentive subjects are unproblematically grammatical in Korean, whether a separate topic constituent is present, as in (2), or not present, as in (3):

(2) Il nyen ceney-nun Sunhee-ka Seoul-ey ka-ess-ta.
one year before-TOP Sunhee-NOM Seoul-LOC go-PAST-DEC
'One year ago, Sunhee went to Seoul.'

(3) Jeongdal-i mun-ul yel-n-ta.
Jeongdal-NOM door-ACC open-PRES-DEC
'Jeongdal opens the door.'

Subjects which bear semantic roles other than agency are also possible in Korean, but significantly only when no agent is present in the conceptual structure of the sentence. For intransitive predicates, this means that the sole argument of the verb is routinely coded as the subject, as for instance in (4) and (5) with patient and locative subjects, respectively:

(4) Kiyong-i mul-ey ppaci-ess-ta.
Kiyong-NOM water-LOC fall-PAST-DEC
'Kiyong drowned.' (Lit. 'Kiyong fell in the water.')

(5) Cip-uy cipung-i say-ko.iss-ta.
house-GEN roof-NOM leak-PROG-DEC
'The roof of the house is leaking.'

For transitive predicates, the constraint against non-agentive subjects means that so-called 'Fillmore sentences' (Hawkins 1986), i.e., sentences in which another argument has replaced an agent as the subject of the sentence, should be ungrammatical. As the following examples demonstrate, this is indeed so:

(6) a. Jeongdal-i i yelsoy-lo mun-ul ye-n-ta.
Jeongdal-NOM this key-with door-ACC open-PRES-DEC
'Jeongdal opens the door with this key.'

b. *Mun-i ye-n-ta.
door-NOM open-PRES-DEC
'The door opens.'

The grammatical sentence (6)a with its agentive subject contrasts with the ungrammatical example (6)b. In the latter example, a patient (*the door*) has been coded as subject despite the fact that, conceptually, an agent (the person who did the opening) is present; the resulting sentence is therefore ungrammatical. To some speakers, such non-agentive subjects apparently become somewhat acceptable when a different modality (for instance, potentiality) is involved, which may account for their acceptance of (6)c. To several other speakers that I have consulted, however, (6)c is not acceptable despite its potential modality:

(6) c. ?I yelsoy-ka mun-ul yel-swu.iss-ta.
this key-NOM door-ACC open-can-DEC
'This key can open the door.'

Of course, non-agents can unproblematically become topics since *-nun* can mark any nominal constituent as topic (Gundel 1988:216). (7)a and (7)b, both from

Gundel (1988: 217), show this for the topicalization of an object and of an adverbial, respectively:

(7) a. I salam-un John-i manna-ess-ta.
this man-TOP John-NOM meet-PAST-DECL
'(As for) this man, John met (him).'

b. San-ey-nun namu-ka manh-ta.
mountain-LOC-TOP tree-NOM many-DECL
'At the mountain, there are many trees.'

In English, the dual nature of subjects as encompassing topics as well as agents appears to be the prime motivation for allowing non-agent subjects in Fillmore sentences; in Korean, however, with its available separate topic constituent, the functional motivation for coding these non-agents as subjects is lacking. There is simply no reason for non-agents to become subjects when alternative coding is possible. This is why neither the temporal *il nyen ceney* 'a year ago' nor the instrumental *il won* 'one won [monetary unit]' can become subjects in sentence (8) though either makes a fine topic. The sentence instead remains overtly subjectless:

(8) Il nyen ceney-nun il won-ulo sey kay-uy phin-ul
one year before-TOP one won-with three CL-GEN pin-ACC
sal-swu.iss-ess-ta.
buy-can-PAST-DEC
'A year ago, one won could buy three pins.' (Lit. 'A year ago, [one] could buy three pins with one won.')

Consequently, sentence (9) from Yang (1972:8–9) can only be interpreted as a personification describing a fairy-tale world where hammers are alive:

(9) Mangchi-ka mun-ul kkay-ess-ta
hammer-NOM door-ACC break-PAST-DEC
'A hammer broke the door.'

2. Grammatical Relation Changing Processes. The availability of the separate topic constituent also means that there is little motivation for grammatical processes which promote phrases to subjecthood since one of the major functions of such processes is the topicalization of the promoted subject. Specifically, raising processes, as well as passivization, should be rare in a language like Korean in the absence of the functional motivation for these processes.

Indeed, there are numerous references in the literature on the rarity of passives in Korean as compared to English or even Japanese, prominently for example in

Hwang (1975:46) and Kim (1987:893). Other grammatical relation-changing processes which create a new subject, notably raising to subject constructions, are conspicuously absent in Korean. The Korean equivalent of English subject-to-subject raising sentences (e.g., *John seems to like Claremont*) simply works like regular embeddings: The matrix predicate *kat* 'seem' appears in sentence-final position; other than the verb morphology, the embedded clause has the same shape as its simple counterpart. This is shown in the contrast between (10)a and (10)b:

(10) a. Nay chinkwu-ka i chayk-ul coaha-n-ta.
my friend-NOM this book-ACC like-PRES-DEC
'My friend likes this book.'

b. [Nay chinkwu-ka i chayk-ul coaha-nun kes] kath-ta.
my friend-NOM this book-ACC like-COMP NML seem-DEC
'It seems that my friend likes this book.'

That *nay chinkwu-ka* 'my friend', the subject of the dependent clause, has not been raised into the main clause can be shown by the fact that it can move freely within the dependent clause, as in (10)c where it has moved after the direct object, but not outside of the clause, as in the ungrammatical (10)d:

(10) c. [I chayk-ul nay chinkwu-ka coaha-nun kes] kath-ta.
this book-ACC my friend-NOM like-COMP NML seem-DEC
'My friend seems to like this book.'

d. *[I chayk-ul coaha-nun kes] nay chinkwu-ka kath-ta.
this book-ACC like-COMP NML my friend-NOM seem-DEC
'My friend seems to like this book.'

If raising of *nay chinkwu-ka* had occurred, this phrase should be able to scramble after the embedded clause *i chayk-ul coaha-nun kes* since Korean permits scrambling within the same clause; only the verb must remain fixed in the clause-final position. However, as example (10)d shows, scrambling of *nay chinkwu-ka* after *i chayk-ul coaha-nun kes* is not grammatical. *Nay chinkwu-ka* is therefore unambiguously part of the embedded clause. Naturally, any constituent of the embedded clause can become the topic of the sentence by simply coding it as such, as in (10)e and (10)f, without any need for syntactic raising:

(10) e. Nay chinkwu-nun [i chayk-ul coaha-nun kes] kath-ta.
my friend-TOP this book-ACC like-COMP NML seem-DEC
'As for my friend, [he] seems to like this book.'

(10) f. I chayk-un [nay chinkwu-ka coaha-nun kes] kath-ta.
this book-ACC my friend-NOM like-COMP NML seem-DEC
'As for this book, my friend seems to like [it].'

Once again, the general availability of the independent topic constituent obviates the need for a grammatical relation-changing operation.

The closest candidates in Korean for syntactic raising are sentences like (11)a which resemble 'tough movement', i.e., the raising of a constituent—typically, though not always, an object—to the subject of a predicate like *tough* or *easy*:

(11) a. Enehak-i kongpuha-ki-ka swuip-ta.
linguistics study-COMP-NOM easy-DEC
'Linguistics is easy to study.'

Song (1988: 338-64) has argued that these sentences really do not involve syntactic raising, and indeed such sentences are only acceptable when the presumably 'raised' subject enters into a semantic relationship with the matrix predicate; contrary to what a raising analysis would predict, they are not grammatical when no such relationship exists. For instance, *enehak-i* 'linguistics' is what is 'easy' semantically in (11)a and so can become the subject of (11)b:

(11) b. Enehak-i swuip-ta.
linguistics easy-DEC
'Linguistics is easy.'

In (12), there is no such semantic relationship between *Sunhee* 'Sunhee' and *swuip-ta* 'easy'. *Sunhee* is the one who gets annoyed and so can be coded as the object of *hwana-key* 'get angry' in sentence (12)a; but she is not claimed to be 'easy', and so coding her as the subject of *swuip-ta* 'easy', as in the ungrammatical (12)b, is not possible, despite the fact that (12)b structurally mirrors the grammatical (11)a:

(12) a. [Sunhee-lul hwana-key ha-nun kes]-un swuip-ta.
Sunhee-ACC get:angry-CAUS make-PNE COMP-TOP easy-DEC
'It is easy to annoy Sunhee.'

b. *Sunhee-ka [hwana-key ha-nun kes]-un swuip-ta.
Sunhee-NOM get:angry-CAUS make-PNE COMP-TOP easy-DEC
'Sunhee is easy to annoy.'

The bracketing of (12)b shows *Sunhee-ka* outside the dependent clause, rendering the sentence ungrammatical; of course, the sentence would be perfectly acceptable if *Sunhee-ka* had not been raised, i.e., if she was bracketed as part of the dependent clause.

Worse yet for a raising analysis, there are also sentences paralleling (11)a with subjects for which a raising analysis does not seem plausible, such as the subject *ipen kumyoil-i* 'this Friday' in sentence (13):

(13)	Ipen	kumyoil-i	kongpuha-ki	swui-wul-kesi-ta.
	this	Friday-NOM	study-COMP	easy-FUT-DEC

'This Friday will be easy for studying.'

All of these facts militate against a raising analysis of sentences like (11)a.

3. CONCLUSION. With the availability of the syntactic topic constituent in Korean, which allows for any participant to become a topic straightforwardly by being coded with *-(n)un*, the functional motivation for promoting underlying non-subjects to subjecthood has dissipated; hence the relative lack of grammatical relation-changing processes and the ungrammaticality of 'Fillmore sentences' in Korean.

This contrasts sharply with English. English is highly subject-prominent and lacks a topic position that is accessible to all participants in a sentence. For example, objects in English can not be topicalized by simply positioning them before the subject without acquiring a contrastive reading, even though adverbials can. As a result, the passive becomes the principal strategy for object topicalization. Various raising processes (*John seems to enjoy himself / John is easy to please*) and the patient subjects found with so-called 'ergative' verbs (*That door opens easily*) (Chomsky 1981) have the same effect of making a variety of participants into subjects and, all things being equal, therefore topics in English. The vastly expanded range of subjects found in English relative to Korean is, therefore, the direct result of the different positions of these two languages in Li and Thompson's typology; the dual prominence of Korean leads to narrower, semantically defined grammatical relations with few grammatical relation changing processes whereas the subject-prominence of English compels a wider range of participants to seek access to subjecthood, be it by means of grammatical relation changing processes like passivization, raising or the middle construction, or by coding them as subjects directly, as is the case in the so-called 'Fillmore sentences'; in either case, the goal is to assure that all participants can potentially be coded as topics. The Korean type of dual prominence thus has syntactic consequences throughout the grammar of the language.

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[1] The following abbreviations are used in this paper: ACC = accusative, CAUS = causative, CL = classifier, COMP = Complementizer, DEC = declarative, FUT = future, GEN = genitive, LOC = locative, NML = nominalizer, NOM = nominative, PNE = prenominal ending, PRES = present, PROG = progressive, TOP = topic.

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THE EMERGENCE OF SO-CALLED ‘FUNCTIONAL CATEGORIES’ IN ENGLISH: A CASE STUDY OF AUXILIARIES, MODALS AND QUASI-MODALS

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This paper focuses on the ontogenetic foundation of English grammatical categories such as auxiliaries and modals and questions the extent to which it is necessary to assume that such categories are innately specified in the grammar. If they are not innate, what abilities must we impute to the child in order for these categories to emerge? One way to think about such questions, rather than from the standpoint of the fully developed adult system, is to ask how a grammar develops—thinking of how a polaroid picture emerges. Also, rather than assuming that all constants and constraints arise from an innate endowment, we can see how many of their sources we can identify: in cognition, in processing and in the social pressures that lead a child to take the linguistic materials offered in the input and to construct a grammatical system that performs necessary functions in particular ways.

I have taken this approach in looking at the emergence of English auxiliaries (*be*, *do*, *have*), modals (*can*, *may*, etc.) and catenatives (*gonna*, *hafta*, *wanna*, *liketa*) in the speech of an English-learning child. If we find that these categories are fully differentiated as soon as they appear, we might consider this possible evidence for innate specification. However, I can demonstrate that they *emerge gradually*. When I trace the development of these forms *backwards* in my data from (nearly) adult forms at 4 years through a documentable sequence of precursors, I can show how all three classes of functors initially emerged at about 2 years as a single post-subject, pre-verb ‘filler syllable’, which is undifferentiated both functionally and phonologically. What does this imply about the child’s ‘innate’ abilities? To what extent does this picture of gradual differentiation of a filler enable us to make more informed conjectures about just which attributes could be learned, which may emerge from developing functional, cognitive and social pressures and which seem likely to be truly ‘innate’?

Obvious candidates for *learned* attributes include phonological forms, details of word order and which attributes, if any, are involved in agreement marking. Possible candidates for *emergent* attributes include increasing resources for expressing attitudinal nuances (e.g., by means of modals and catenatives) and semanto-syntactic knowledge about whether a particular catenative needs to be able to include a second subject (contrast *wanna* and *liketa* with *gonna* and *hafta*). In my view, candidates for *innate* attributes are likely to involve constraints on syntactic structures. They might include the way modals and auxiliaries are incorporated into verb phrase structure, possible mechanisms for marking various kinds of agreement across words and the way that catenatives contain infinitive verbs (a realization which may be triggered by the discovery of raising for *wanna* and *liketa*; e.g., the relation between *I wanna go* and *I want you to go*).

My approach is driven by the following two assumptions:

(1) an understanding of language development must be grounded in what makes perceptual, functional and cognitive sense for learners;
(2) learners can and do create *partial* and *increasingly specific* analyses of grammatical forms which gradually approach their adult targets.

We begin our backwards developmental journey at a point when the subject has syntactically differentiated the three target classes: catenatives, auxiliaries and modals. Moving back we find a stage characterized by production of preverbal forms which are not yet fully segmented (hence the AMALGAM stage) which are used to modify the meaning of the following verb, but not precisely along the lines of adult grammar. Identifiable functions are to make requests, state intentions and initiate interactions. The child does not yet treat any of them as forms to which inflections can be added. At the PROTOMODAL stage we find preverbal filler syllables which, although they are distinct from protosubjects, are no longer/not yet identifiable with the long list of adult targets and illocutionary functions found at the amalgam stage. Finally, at the filler stage, all we can identify is a class of preverbal syllables which has not yet separated into protosubjects and protomodals.

1. BACKGROUND. My data are from a longitudinal study of a severely visually-impaired child named Seth. The original materials on the development of Seth's language between 1:4 and 4:4[1] were collected by his father, Bob Wilson, who was a graduate student in linguistics at the University of Hawai'i during that period. (See Peters 1987, 1993; Peters & Boggs 1986; Wilson & Peters 1988 for details.) I have been working with a set of 33 half-hour transcriptions of audio tape, spread over the period from 1:9 to 4:1 (bi-weekly until 2:6; monthly until 3:0; bi-monthly until 4:1); they almost exclusively contain father-son interactions at home or on outings.

As Seth first moved past the one-word stage at about 1:7, he began sporadically preposing 'filler syllables' to open-class words; e.g., alongside *cup* he might say *ə cup*, or *ŋ cup*. When he began producing these fillers, an observer could not tell what they would develop into, if they survived at all. Once they had taken on more characteristics of adult targets, however, it has been possible both to identify their targets and to trace their development backwards, to uncover characteristics that distinguished subgroups of fillers almost from the beginning. For instance, from as early as 1:8, Seth produced two relatively distinct kinds of fillers, one predominantly nasal, the other more oral. His father's intuition at the time was that the nasal fillers were predominantly used in requests (perhaps an early approximation of *want*), while the vocalic fillers were more deictic in function (personal communication).

In my analysis of Seth's progress in producing these forms I looked at how close to adult target he was and how consistently his productions patterned. In the process I identified five developmental stages, which we will follow in reverse, first looking at Stage 5, the final one for which I have data. At this point Seth gives evidence of having morphologically and syntactically differentiated three types of preverbal modifiers: auxiliaries (forms of *be* and *do*), modals (including *can*, *could*, *would*, *will*, *wont*) and catenatives (including *wanna*, *gonna*, *hafta*, *liketa*). After a brief look at Stage 4, which is similar to Stage 5, except for certain details that are still being worked out, we move back to Stage 3, in which it is easiest for the researcher to distinguish his preverbal modifiers on the basis of the functions he uses them for rather than on their syntactic properties. Functions include interaction-initiators, intention-markers and request-indicators. Structurally, most of these forms are unanalyzed or incompletely analyzed amalgams of more than one adult morpheme, such as *didja*, *əmmə* or *əyə*. Moving back to Stage 2 we see the flourishing of a class of fillers which has two important characteristics: it has its own identifiable preverbal position and it has its own phonological core, both of which are distinct from those of a separate class of protosubjects. I call these the PROTOMODALS. Finally, at Stage 1 we find the initial emergence of fillers, during which period they are sporadic and not yet differentiated phonologically or positionally.

2. The Development of 'Protomodals' In Reverse

2.1 Stage 5 (3:2–4:0); Near-Adult Categories. By the time he is 4, Seth's productions clearly show that he distinguishes catenatives from modals from auxiliaries; evidence is that although all three kinds of functors share the position in front of main verbs, their members are phonologically and morphosyntactically distinct. His catenatives include *wanna*, *liketa*, *gonna*, *hafta*, *needta* and *tryta*. He inflects some of these for number (*likesta*, *hasta*, *needsta*) and tense (*hadta*, *triedta*). Both *wanna* and *liketa* behave like raising verbs (allowing correctly placed separate subjects for the catenative and main verbs when appropriate, as in *I want you and DJ ta feed birds* or *because I like you to have it* ***slow***). In contrast, *gonna*, *hafta*, *needta* and *tryta* are never found in such constructions. *Wanna*, *liketa*, *hafta* and *needta* are negated with *dont*, while *gonna* is negated with appropriate forms of the auxiliary *be*. His modals include *can*, *could*, *will*, *would* and *shall/should*. None of these is ever inflected for number, although the negative forms *cant*, *cannot*[1] and *wont* are attested. Both his *be-* and *do*-auxiliaries are also very productive. Inflections for number include *does*, *is*, *are* and *am*; inflections for tense include *did*, *was* and *were*; negatives include *dont*, *didnt*, *isnt*, *Im not*, *s not*, *wasnt* and *re not* (but not *arent*). At

3:10 he produces the only number agreement error on an auxiliary that is attested in the transcriptions from Stage 5: *where does paint brushes go?*

2.2. Stage 4 (2:6–3:2) Final Struggles. Although Seth is close to target in many ways during the period between 2:6 and 3:2, he expends detectable effort to get various aspects of auxiliaries under simultaneous control. The sporadic evidence of struggles with some aspects of these forms includes a range of problems with number marking and auxiliary placement and choice. Some of his problems at this stage may be exacerbated by his formation of questions with the amalgam *whatta*, which has likely sources in *what-a*, *what-are*, *what-did* and *what-do*. (See Wilson & Peters 1988 for discussion.)

Number marking problems:

- *placement*: 3:2, a set of consecutive utterances:
    S: What d… what sound does the lion make?
    Dad: They roar.
    S: Does… where do**es** lion**s** live.
    Dad: Oh… in the big fields.
- *double number marking*: e.g., 2:11: ‘What do**es** Mister Holt need**s**?’
- *misplaced* is/*double number marking*: 3:0: ‘Wha’ Daddy’**s** doing?’
- *placement on main verb instead of auxiliary*: 2:9: ‘What **da** ‘light’ mean**s**?’ [asking for the French translation]

Auxiliary problems:

- *wrong choice:*
    do for *are*(?): 3:4: **Do**… you cool it up?; 2:10: How **do** we gon’ get down?
    is for *do*: 2:9: **Iz**… **iz** Daddy find a T; 2:8: **Is** i’ means down?
- double *are*: 3:2: Yes you’**re** sure **are**!
- double *is*?: 3:0: **Is** a kitchen light **is** blinking?
- auxiliary use with *whatta*:
    whatta with *are*: 2:8: **Whatta** you’**re** gonna smell?
    whatta with am: 3:2: **Whatta** I’**m** lying on?

2.3. Stage 3 (2:0–2:6, with some extension to 2:10); Amalgams for Initiating, Announcing, Requesting. If we move back one more stage, we see a rather different picture: Seth is producing a set of phonologically distinct forms which do not precisely conform to adult targets because they seem to be incompletely segmented (e.g., *əmmə*, *əŋə*, *əyə*, *d́ya*, *sh́we*). I am calling them amalgams. Moreover, their functions also seem not to be directly mappable onto the functions of adult modals, auxiliaries, or catenatives. One way to make sense of them is to identify the functions *Seth* uses them for. I find three:

Initiation of verbal interaction (often by making a statement about something he just did or heard); e.g.,

- 2:0.2, as Seth falls:
  Dad: uhoh!
  S: **didja** fa-all?
  Dad: did you fall down?
  S: **didja** fall.
  Dad: listen, ya better let me kiss it—better give me a kiss.
- 2:3.1, while they're playing with a ball:
  S: whe's'ə ball.
  Dad: under Daddy's bed.
  S: **didja** find it? (as he finds it)
  Dad: didja find it?
  S: yeah.
- 2:8.2, S runs his hands through Dad's hair uttering a characteristic 'doodle-doo':
  S: oodl-doodl-doot doot doot doot doot doot doot dood etc.
  Dad: oh…
  S: **are'ya** gə ruin Da'y's hair?
  Dad: are you gonna ruin Daddy's hair.

Announcing his intention to perfom some action; e.g.,

- 2:2.3, playing ball:
  S: **mmmə** throw'it… **ŋgə** throw Daddy head.
  Dad: good throw .
- also 2:2.3, playing with some quarters:
  S: **c[an'y]ou** find a quarter? (referring to himself)

requesting action by his father; e.g,

- 2:1.2:
  S: **lets** get down. **lets** get down əŋ go in ə kitchen.
- 2:2.0, while playing ball, he wants Dad to throw the ball back to him (Seth):
  S: **ha'a** frow'it back ta Daddy?
- 2:3.1, while playing ball:
  S: **want** Daddy sitdown frow it.
  Dad: OK.
- 2:5.0:
  S: d'ya **wan'** Daddy ta pick ya up…
  ya **wan'** Daddy ta pick… (question intonation)
  wwan' Daddy ta pick ə up. (whiny statement)
  wan' Daddy ta pick ya up.
  wan' Daddy ta pick ya up? (request without fussing)
  Dad: y'want me ta pick you up?

Forms used to initiate verbal interaction, often by announcing an event:		
didja	2:0.0-2:6.3	did you [just do X]
iz	2:0.2-2:4.2	it's; is it; didja [just happen]
hafta	2:2.3-2:4.0	have to X [just did X]
can/ket	2:3.1; 2:6.3	can X [just did X]
əya gon	2:4.0-2:5.0 (2:6.3)	are you gon(na) [do X]
Forms used to announce his own intentions:		
əŋə	2:1.0-2:4.0 (2:6.0)	I'm gonna [do X]
əmmə	2:0.0-2:4.2	I'm gonna; I wanna [do X]
can	2:1.2-2:5.0	I/we can [do X]
let	2:2.3-2:5.2	let's/lemme [do X]
i'll	2:3.1-2:4.2	I will [do X]
wouldja	2:4.0	would you [do X]
could	2:8.0	I/we could [do X [if I want]]
Forms used to request an action by Daddy:		
lets	2:1.2-2:5.2	let's [do X]
hafta	2:2.0-2:4.2	I/we have to [do X]
want daddy	2:2.3-2:5.2	do you want Daddy to [do X]
i can	2:2.3-2:5.2	I can [do X]
can daddy	2:3.1-2:6.3	can Daddy [do X]
let daddy	2:3.1-2:5.2	let Daddy [do X]
d'ya want	2:3.1-2:4.2	do you want (to) [do X]
sh'we	2:4.2-2:5.2	shall/should we [do X]
will	2:5.0-2:9.0	I/we/Daddy will [do X]
didja	2:5.0-2:5.2	did you [do X]
could	2:8.0-2:9.0	I/we/Daddy could [do X]
wouldja	2:4.2?, 2.11	would you [do X]

Table 1.

Table 1 lists the forms I have identified for each use, their approximate ages of use and their adult sources—which are, in fact, modals, auxiliaries or catenatives, amalgamated with pronouns, *to* or *Daddy*.

2.4. Stage 2 (2:1-2:5), Differentiation of Protomodals, and Stage 1 (1:8-2:1), Emergence of Fillers. What preceded the amalgams are his 'filler syllables', which are even less clearly identifiable with respect to possible adult targets (in other words, phonologically) and which also have less clear functions. It makes most sense at this point to look all the way back to the first appearance of these fillers. We then see that their development falls into two stages: undifferentiated fillers followed by protomodals.

At around 1:8 Seth begins producing preverbal filler syllables, which, although they have a range of phonological forms [ə, ŋ, ən, ɛ, əŋ, də, dl, əgl], are not easy to classify functionally. Frequently productions include sequences in which fillers are variably present in the 'same' construction:

- 1:11.0, in the bath:
  S: **n** tə[rn] **off.** (2 times)
  turn **off**! (3 times)
  Dad: you wan' me turn it **on**.

Or they may have varying forms for no detectable reason—perhaps attempts to find a way to make himself clearer.

- 1:11.0, playing in clothes basket
  S: jeans'on?
  Dad: ⎰ I don't want those damn smelly clothes.
  S: ⎱ **əw** pu jean**jon**?
  Dad: ⎰ put it in the basket.
  S: ⎱ **əm** pu jean jə̃? əm pu jeanjə̃
  m pu' c[l]o[the]s ɔ̃? (2 times)
- 1:11.2, mealtime
  S: **n** drink'it? '**ən** drink'it? '**ẽ** drink'it?
  more p'ease? (urgently)

Beginning at about 2:1.2, this single-filler stage gradually shifts into a phase during which the presence of two preverbal fillers becomes more common. Moreover, the 'inner' filler tends to be more nasal. while the 'outer' (initial) filler is more often oral. Sometimes oral and nasal syllables alternate in the same position.

- 2:1.2:
  S: **yu wn** do 'gain?
  Dad: OK. do it again.
  S: '**n** do 'gain?
  Dad: OK.
- 2:1.2:
  S: '**ə wə** git out Daddy —-
  '**n** git down? (3 times)
  Dad: you want to get down? come on.
- 2:1.2:
  S: /ayn/ turn lights off.
  Dad: oh. oh— well come— come help me turn the light on, ok?
- 2:2.0:
  Dad: if you wanna listen ta Peter 'n' the Wolf it's all right.
  S: **əw wənna** listen Peter Woof?
- 2:2.3:
  S: **mmmə** frow'it… əŋ gə̃ fwow Daddy head.
  Dad: good throw .

- 2:2.3:
  S: wə hear da duck… ə̃ hear da duck .
  Dad: OK.
- 2:2.3:
  S: wə̃ get da ball too. ŋ go git da ball.
  Dad: OK, but don't throw it on Daddy right now

Although the protomodals become increasingly easy to identify phonologically with adult targets, their paradigmatic substitutability can be seen in a sequence recorded at 2:3.1, while Seth was sitting in the car, squeaking his seatbelt:

can	make	it	go	squeak.
want	make		go	squeak.
əm	make		go	squeak.
did	make	that		squeak?

3. Conclusion. Catenative constructions, which involve two verbs (the first finite, the second not) and a possibility of two distinct subjects, may seem complex in *adult* grammar, but Seth's developmental sequence shows how it is possible for them to *originate* in a *simple single-subject construction* in which the main verb is modified by one of a single class of protomodals: SUBJ PM VP. We can simply and naturally describe their development as taking place through the phonological, functional and syntactic differentiation of an initially fuzzy protomodal 'slot'.

I conclude that a positional slot can serve as a *perceptual nucleus*, in association with which the learner can accumulate information about its members in the target language. This slot thus serves as a sort of 'holding tank' for such positionally relevant information as will eventually allow the learner to differentiate the grammatical bits that occur there into the appropriate set of adult classes. In other words, when learners create undifferentiated classes of protomorphemes, each positionally-defined class becomes a Holding Tank for the accumulation of enough information to enable its subsequent breakup into more adult-like classes. In the present case, the Holding Tank is the Protomodal position. Just like the polaroid mentioned earlier, the grammar emerges, becoming increasingly detailed.

To the extent that this developmental picture for these three fuctional classes is generalizable for English-learning children, I propose a set of steps that goes something like this:

(1) Children in their second year can already distinguish nouns from verbs from 'other forms'.[3]
(2) On the basis of *phonological presence* alone, they separate out an undifferentiated preverbal class of Protomodals, which includes all the regularly occurring catenatives, auxiliaries and modals.

	Developmental Step	**Bases**	**Source**
1	Distinguish content from non-content elements	frequency, match to context, stress	learning
2	Distinguish Nouns from Verbs	position, semantics	learning
3	Identify an undifferentiated preverbal positional class	phonological presence	learning
4	Collect information about phonology and function	phonology, semantics, pragmatics	emergent learning
5	Realize these forms can modify the force of verbs i.e., are (proto)-modal	pragmatics	emergent learning
6a	Differentiate modals from auxiliaries	distribution of inflections for number and tense	learning
6b	Discover infinitives	*to*-marker, raising	innate??
7	Differentiate catenatives	distribution, syntax	??

Table 2.

(3) They continue to collect information about the phonological, syntactic and semanto-pragmatic properties of this class.
(4) They may or may not begin to reproduce their protomodals as filler syllables; if they do, they will not assume them to be forms to which inflections can be added.
(5) With experience with the language, they become increasingly able to differentiate members of this class on the basis of *phonology*, *syntax* (cooccurrence privileges), *semantics* (how the meaning of the following verb is modified) and *pragmatics* (what one uses these forms to **do**).
(6) Eventually they subdivide the protomodals into three classes: catenatives, auxiliaries and modals.

How does such a picture help us think about which attributes of grammatical function words need to be learned, which seem to emerge from developing functional, cognitive and social pressures, and which might be truly innate? Putting this sequence together with the kinds of information that would allow each devekopment to take place, I have come up with table 2.

It seems to me that most attributes can be *learned* on the basis of various, increasingly available sources of information. At the moment I am most doubtful about constraints on the most syntactic aspects of these structures. I invite you to take these heuristic suggestions and see what sense you make of them.

[1] Ages are in the format *years:months.(weeks)*.

[2] Hawaiian Creole English and to some extent Hawaiian Standard English, uses the form *cannot* in preference to *can't*. Because Seth received both 'local' input at school and a more 'mainland' variety from his parents he shows some variation in which form he chooses.

[3] I do not think that they need be able to distinguish lexical from functional categories, as has been proposed (e.g., Stromswold 1995); they only need be able to identify the most content-bearing words in an utterance and be predisposed to focus on them. The likelihood that the most content-bearing words in an utterance will also be the most acoustically salient ones, is no doubt a major clue in their identification.

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IV. SEMANTICS

FUNCTIONAL SENTENCE PERSPECTIVE, FOCUS OF INFORMATION AND SEMANTIC RELATIONS

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1. The problem. Katherine Mansfield's short story 'At the Bay' (1945:205–45) is a wistful account of a summer's day in the lives of New Zealanders on holiday. Various members of two neighboring families interact while reflecting on freedom and constraint, affection and communication, the beauty and seeming indifference of nature. Jan Firbas takes up a segment of this text (Figure 1) in his book on Functional Sentence Perspective (1992), finding that it offers a useful variety of semantic roles in clause structures for illustrating the dynamics of information. The same segment is considered in this paper because the Firbas treatment offers a ready-made and authoritative example of Functional Sentence Perspective (FSP) analysis which can be usefully compared with other procedures for analyzing the contrast in clause structures between 'given' and 'new' information.

In FSP terms, this contrast is a distinction between Theme and Rheme in sentence and clause structures, with Theme as a label for the elements which advance the flow of information least, and Rheme as a label for the elements which advance its progress most. Within the terminology of the Systemic-Functional theory of Focus of Information (FI), a similar distinction is made between given and new information, with given as the label for the elements of clause which show the greatest continuity with the preceding discourse, and new as the label for the elements which the speaker of utterances focuses on as providing most novelty or contrast with preceding discourse. Neither of these approaches is primarily oriented to the structure of discourse, however. FSP accepts context dependency as a constraint, but relies primarily on clause semantics. FI explicitly identifies the stretch of new information in clause structure, in whole or in part, without developing a systematic description of the given information as such.

One approach more specific to discourse would be to examine types of semantic relations among elements of clause structure, and to measure relative givenness or newness of such elements from the nature of their relationships with preceding elements. For example, iteration could be taken to represent unqualified continuity, and absolute variation could be taken to represent unqualified novelty. Such a procedure could avoid some of the indeterminates detectable in FSP, such as the identification of semantic roles, and could add to the descriptive power of the FI treatment of given information. The main purpose of this paper is to hypothesize

(1) In a steamer chair, under a manuka tree that grew in the middle of the front grass patch, Linda Burnell dreamed the morning away. (2) She did nothing. (3) She looked up at the dark, close, dry leaves of the manuka, at the chinks of blue between, (4) and now and again a tiny yellowish flower dropped on her. (5) Pretty—(6) yes, if you held one of those flowers on the palm of your hand and looked at it closely, it was an exquisite small thing. (7) Each pale yellow petal shone as if each was the careful work of a loving hand. (8) The tiny tongue in the centre gave it the shape of a bell. (9) And when you turned it over the outside was a deep bronze colour. (10) But as soon as they flowered, they fell and were scattered. (11) You brushed them off your frock as you talked; (12) the horrid little things got caught in one's hair. (13) Why, then, flower at all? (14) Who takes the trouble—or the joy—to make all these things that are wasted, wasted… (15) It was uncanny.

(16) On the grass beside her, lying between two pillows, was the boy. (17) Sound asleep he lay, his head turned away from his mother. (18) His fine dark hair looked more like a shadow than like real hair, (19) but his ear was a bright, deep coral. (20) Linda clasped her hands above her head (21) and crossed her feet. (22) It was very pleasant to know that all these bungalows were empty, that everybody was down on the beach, out of sight, out of hearing. (23) She had the garden to herself; (24) she was alone.

(25) Dazzling white the picotees shone; (26) the golden-eyed marigold glittered; (27) the nasturtiums wreathed the veranda poles in green and gold flame. (28) If only one had time to look at these flowers long enough, time to get over the sense of novelty and strangeness, time to know them! (29) But as soon as one paused to part the petals, to discover the underside of the leaf, along came Life (30) and one was swept away. (31) And, lying in her cane chair, Linda felt so light; (32) she felt like a leaf. (33) Along came Life like a wind (34) and she was seized and shaken; (35) she had to go. (36) Oh dear, would it always be so? (37) was there no escape?

(38) Now she sat on the veranda of their Tasmanian home, leaning against her father's knee. (39) And he promised, (40) 'As soon as you and I are old enough, Linny, we'll cut off somewhere, we'll escape. (41) Two boys together. (42) I have a fancy I'd like to sail up a river in China.' (43) Linda saw that river, very wide, covered with little rafts and boats. (44) She saw the yellow hats of the boatmen (45) and she heard their high, thin voices as they called… (Firbas 1992:26–27)[1]

Figure 1. Annotated extract from Katherine Mansfield, 'At the Bay'.

how the results of such a procedure would compare with the results of FSP and FI analyses. Another purpose will be served by comparing the results of this procedure with that obtained by a computational analysis of semantic relations in text (Cummings 1995, 1996, forthcoming).

2. FUNCTIONAL SENTENCE PERSPECTIVE ANALYSIS. FSP recognizes three factors in the assignment of information status—context dependency, semantics, and linearity—prioritized in just that order (Firbas 1986:43–47). Context dependency means semantic continuity with elements from the preceding discourse, and is frequently realized by reference items like anaphoric pronouns, or by lexical iteration. Where context dependency is not observed, semantic roles ordered on a scale of increasing

informational novelty are assigned, such that a Setting (Set) is least informationally dynamic, and a Further Specification (FSp) is most:

Set→Pr→Ph→B→AofQ→Q→Sp→FSp

Setting	Set
Presentation	Pr
Phenomenon	Ph
Quality Bearer	B
Ascribing of Quality	AofQ
Quality	Q
Specification	Sp
Further Specification	FSp

Where neither context dependency nor semantics is at issue, then simple left to right linearity is taken to realize increase in informational dynamism (Firbas 1992:21–40, 66–74). Context dependency cannot simply be equated with reference or lexical cohesion, since anaphoric pronouns or lexical iterations sometimes realize items which are seen to be entirely new within the flow of information (ibid:31–37).

Information status in clause has its own notation. Least dynamic elements belong to the Theme stretch, and most dynamic to the Rheme. Between these is the Transition. Degrees of dynamism within these categories are distinguished such that dynamism increases across the categories Transition Proper, Transition Proper oriented, and Transition; and across the categories Rheme and Rheme Proper:

Theme	Th
Transition proper	TrPr
Transition proper oriented	TrPro
Transition	Tr
Rheme	Rh
Rheme proper	RhPr

Additional notation in the formal analysis includes:

context dependence	d
linking and boundary function	+

To demonstrate FSP analysis, sentence (6) from Figure 1 is selected because its clause elements show a useful variety of semantic types:

(6) yes, if you held one of those flowers on the palm of your hand and looked at it closely (Set, Th), it (B,d, Th) was (+, TrPr; AofQ, Tr) *an exquisite small thing* (Q, RhPr).

[if (TrPro) you (B,d, Th) held (+, TrPr; Q, Tr) *one of those flowers* (Sp, Rh) *on the palm of your hand* (FSp, RhPr)]

[and (TrPro) looked (+, TrPr; Q, Tr) at it (Set, d, Th) *closely* (Sp, RhPr)]

(ibid:71–79)

The Theme elements in the sentence are semantically Setting and Bearer—one of which, ‘it’ , has context dependency (d). The item ‘was’ actually realizes two informational categories, TrPr and Tr because it implies a ‘temporal and modal’ feature (ibid:70–73) as well as an Ascribing of Quality. The Rheme (italicized), which consists solely of a RhPr, plays the role of Quality. The first Theme element includes two embedded clauses, and the analysis of each of these is appended in brackets. In the first embedded clause, the core semantic roles are Bearer of Quality realized by Subject, Quality realized by Predicator, Specification realized by Complement, and Further Specification realized by Adjunct, in an ascending order of dynamism. In the second embedded clause, however, the Thematic Setting comes between the Transition and the Rheme Proper.

3. FOCUS OF INFORMATION ANALYSIS. In the theory of Focus of Information, priority is given to spoken text, so the analysis of written text is as if recited. Prosodically, a text is constituted of roughly isochronous feet, each foot consisting of a stressed syllable and possibly one or more unstressed syllables. Sometimes the stressed syllable is replaced by a silent ictus. Intonationally, a text is constituted of tone groups, each tone group distinguished by an intonation contour and climaxed by a foot whose stressed syllable is ‘tonic’, that is, bearing the most radical change in pitch within the contour (Halliday 1967b:200–11, 1994:295–98).

Informationally, the tone group maps together with the ‘information unit’, whose ‘focus’ is on the grammatical element distinguished by having the tonic syllable. The typical or unmarked place for the focus is in the last lexically realized element within the information unit, as in ‘I’d **like** that!’ (tonic syllable bolded). When the tonic syllable falls elsewhere, the focus is marked, as in ‘I’d like **that**!’, which shows the focus on a non-lexical element. Another instance of the marked focus is when it falls upon a lexically-realized element which is other than final. Grammatically, the clause or clause segment mapped together with the tone group/information unit is divided linearly between an optional given segment and a default new segment. An unmarked focus of information marks the end of the new information segment, while the beginning is left indeterminate. A marked focus designates its grammatical element as the sole new information and projects given status onto the rest (ibid).

An FI analysis of (6) recited might look like the following:

(6) a. // **yes**, //
b. //‸ if you / held one of those / flowers on the / palm of your / **hand** //
c. // _ and / looked at it / **closely**, //
d. // _ it was an ex / **qui**site small thing. //

Notationally, each of four separate tone groups/information units is bracketed with double slants. Feet are separated by single slants. Tonic syllables are bolded and silent ictus is represented with a carot. Stress always occurs only on the first syllable or as a silent ictus in each foot. The focus in each of the first three information units is unmarked. The implication for the distribution of given/new information is that the clause element terminating each of these information units also terminates the stretch of new information in the clause or clause segment which is mapped together with that information unit. However, the beginning point of the new information in each information unit is left indeterminate. On textual grounds, systemicists would have no trouble finding that 'if you' in (6)b is a given information segment. The fourth tone group/information unit shows a marked focus of information, distinguishing the modifier 'exquisite' alone as new information. Important differences from the FSP analysis in the FI analysis include the binariness of the given/new distinction, its confinement to clause or less inclusive grammatical unit, the potential indeterminacy of boundaries, and the potential for distinguishing given from new within grammatical units below the rank of clause.[2]

4. SEMANTIC RELATIONS ANALYSIS. An analysis of semantic relations implicit among various formal items of the text, regardless of sentence or clause structure, is the basis for a third approach to the given/new distinction. The semantic categories employed here are conventional in the literature on semantics (e.g., Lyons 1977: 291–95, 311–17), but the taxonomy to be presented is particularly indebted to Firbas 1992. Firbas (31–32) offers an ordered series of semantic categories as a basis for explaining the perception of context dependence or independence in FSP. For the semantic relations (SR) analysis of text, this series is here expanded to include the following categories; the order from the most connected information to the least is offered strictly as hypothesis:

SEMANTIC CATEGORY	MEANS OF REALIZATION
iteration	lexical repetition
substitution	pronoun or deictic
close synonym	lexical item
superordinate	"

(Semantic category)	(Means of realization)
hyponym/meronymy	lexical item
co-relation	"
loose synonym	"
mere association	"
variation	"

This scale is implicitly taxonomic insofar as the first eight categories represent association, and the last the opposite; moreover the first four represent reference, and the other four associations do not. The first four categories have a high potential for suggesting given information status, and the remaining categories have a progressively higher potential for suggesting new information status.

A semantic relations analysis of (6) would simply label formal items with the semantic categories realized:

(6) yes, if you (sub.) held (v.) one (mer.) of those flowers (it.) on the
palm (v.) of your (sub.) hand (mer.) and looked (it.) at it (sub.)
closely (v.), it (sub.) was an exquisite (v.) small (c.s.) thing (sup.).

KEY:

iteration	it.
substitution	sub.
close synonym	c.s.
superordinate	sup.
hyponym/meronymy	hyp./mer.
co-hyponym/co-meronym	
loose synonym	
mere association	
variation	v.

Each of the semantic categories applied to lexical items or anaphoric substitutions represents a relation to at least one item previous in the text within a span of 30 items.[3] Secondary relations (i.e., to another previous item and representing a relation lower on the scale) are omitted. Items which can conveniently be thought of as given information on this basis include 'you' (sub.), 'flowers' (it.), 'your' (sub.), 'looked' (it.), 'it' (sub.), 'small' (c.s.), and 'thing' (sup). A comparison with the FSP and FI analyses shows significant variation and reinforcement among the three. All agree that 'you' is given. However, the FSP and (by implication) FI analyses include 'flowers' and 'your' within stretches of new information. Only the FSP analysis specifically agrees that 'it' in the second clause is given. The FI analysis of the last clause would agree perfectly with SR, but the FSP analysis would agree only that 'it' is again given, including 'small thing' within new information.

5. Computational analysis. A fourth method is a computational analysis, Analyzing Semantic Connectivity in Texts (ASCIT). Like SR analysis, it equates givenness with connectivity. However it tries to establish the relative connectivity of each lexical item or lexical substitution in a text to each preceding item in a span, thus treating givenness as a field effect dependent on the aggregate semantic relations of the nodal item. The semantic distance of that item from each of the preceding items in the span is computed from a semantic graph which links each of the lexical referents of the text in a network of transitive relations. Givenness for any one item in the text is perceived as a numerical output of the equation

$$G_{net} = 1/c1^{e} + 1/c2^{e} + \ldots 1/c_{n}^{e}$$

in which the givenness (G_{net}) of a nodal item is the sum of the inverse of the cost (c) of traversing the graph from the nodal referent to each of the other referents in the span (raised to some power for purposes of scale). Computer methodology has been fully described elsewhere (Cummings 1987, 1995, 1996, forthcoming).

An excerpt from the semantic graph database for the Mansfield text is represented in Figure 2. Each node in the graph is a lemmatized lexical item from the text, linked together in Systemic-Functional system network notation (cf. Halliday 1967a:38). Links between semantically associated nodes are costed such that the identity relation is given a cost of 1, mother-daughter a cost of 2, sister-sister 3 and so on additively. Some nodes have been postulated to explain evident co-relations, and these have been bolded in Figure 2.

Results for a section of the text containing sentence (6) are represented in Figure 3. Interlineated with the text is a graph line whose height at each lexical item or lexical substitute indicates degree of givenness on a scale ranging from (0.0)1 to (0.)15—values of G_{net} divided by the size of the span (30) to give an average.[4] The horizontal between values 0.03 and 0.04 represents the most plausible demarcation between given and new for the whole output. The wave shape showing oscillation between given and new is typical for the results of all such analyses. The analysis of sentence (6) indicates that the results of the SR method are matched by the results of the ASCIT procedure. Items which in the former represented semantic relations suggesting given information (it., sub., c.s., and sup.) here have average values from 0.18 to 0.04, and those items which represented semantic relations suggesting new information (mer., v.) here have average values from 0.02 to 0.01. However there is no consistent range of values corresponding to each of the relations in the SR scale; e.g., items in (6) ascribed identity relations here show variously values of 0.14, 0.06, 0.18, 0.04, 0.07, and 0.10, due to the field effect.

6. The complete text. A comparison of results from each of the four methods applied to the whole of the Mansfield text confirms the comparison of results based on sentence (6) alone. Throughout the text, the given/new distinction based on the

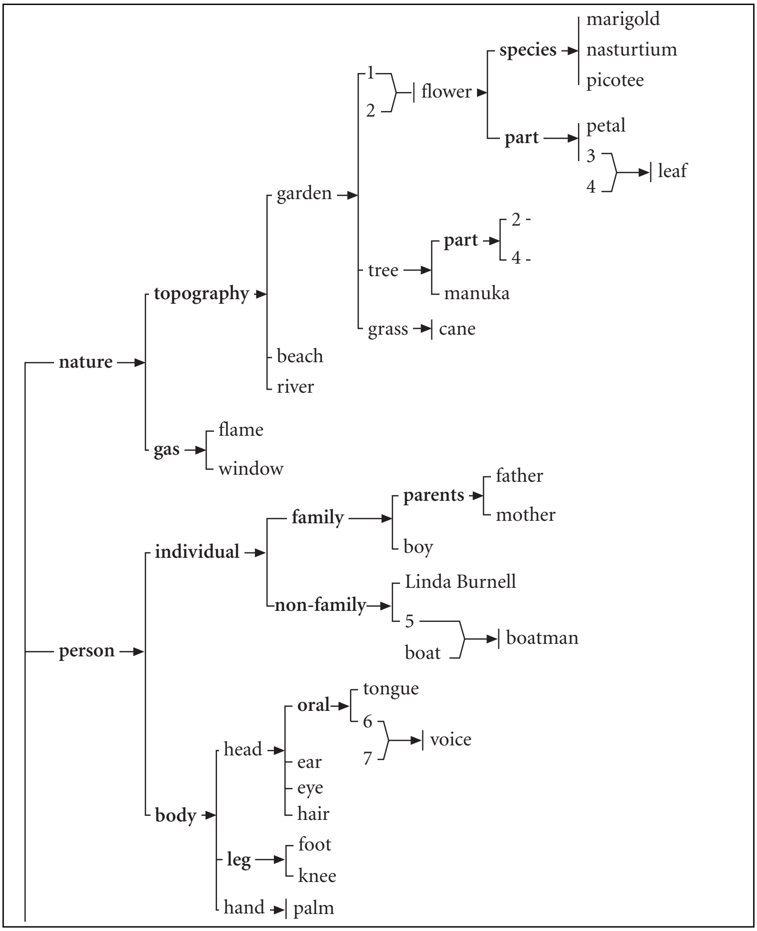

Figure 2. Extract from semantic graph of Mansfield text.

ASCIT average values is almost completely consistent with the same distinction based on semantic relations. Marked and unmarked focuses of information, based on the given/new distinction derived from either of these two methods, yield not a necessary intonational reading of the text, but at least a reading which is nearly everywhere plausible.

However, comparison between these three sets of results and the result of FSP analysis shows both consistencies and significant inconsistencies. There is a perfect correlation between SR category 'substitution' and FSP 'context dependency'. But iterations in the FSP analysis are only perceived as context dependent about half the time (even omitting from consideration iterations which are modifier elements in

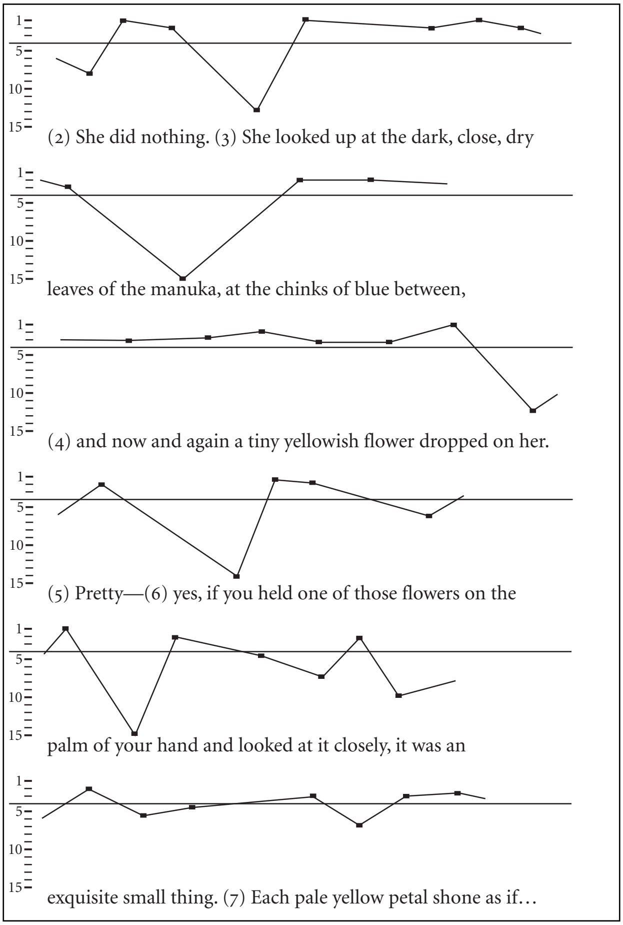

Figure 3. Extract from ASCIT output for Mansfield text.

rhematic nominal groups and therefore not affecting perceived givenness of the group). The only instances of close synonyms are also as modifier elements in rhematic nominal groups. Only one out of four superordinates is perceived in the FSP analysis to be context dependent. Hyponyms, meronyms, co-relations and variations show consistency with FSP analysis insofar as it never designates them as context dependent. However, such elements are often declared Thematic on the basis of the FSP semantic scale. These results fully exemplify the difference between methods based on discourse semantics and a method based on the semantics of sentence or clause in isolation.

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[1] I am indebted for the transcription of this text to Mr. Zhang Ren, Graduate Programme in English, York University.

[2] FSP does analyze the structure of noun phrases in terms of theme/rheme, but at a separate rank of information structure. The method was not carried through in the specimen analysis quoted (cf. Firbas 1992:83-86).

[3] Previous experiments with the ASCIT method has suggested optimal results for modern English text with a span set for 30 items (Cummings 1995:451).

[4] Values of G_{av} greater than 0.15 have been reduced to that value in the diagram.

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PREDICTABLE VS. UNPREDICTABLE POLYSEMY

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1. Semantic field of tactual verbs.[1] The sense of touch has always been related to the field of emotions. Expressions such as *I'm deeply touched* or *touching words* are widely used in English. Hans Kurath had already classified sense perception in respect to emotions and stated how 'the kinaesthetic, the visceral, and the tactual perceptions have a relatively stronger tone than those of hearing and especially of sight, the taste-smell perceptions taking a middle ground' (1921:39). Kurath explained this transfer of meaning from sense perception to emotion on the basis of the similarity of feeling that both domains share. This connection finds an explanation in etymology as well. Buck (1949:1062) points out that the general word for 'feel of' and for 'feel' as 'perceive by touch' in West Germanic languages refers not only to the physical perception but also to the emotions, even in the earliest periods of the language. In the 90's, Eve Sweetser (1990) proposed the same mappings between these two domains within the framework of cognitive linguistics. One of the main claims of this model (Johnson 1987; Lakoff 1987; Langacker 1987, 1991) is that linguistic structure is based on human cognition, i.e., on human perception and understanding of the world. Reality cannot be accessed independently from human categorisation, and consequently the structure of reality as it is reflected in language is a product of the human mind. Sweetser applies these cognitive ideas to the study of semantic change and claims that the paths of semantic change are unidirectional: from the external (sociophysical) domain to our internal (emotional, psychological) domain; that is to say from a concrete source domain to an abstract target domain. These mappings between different conceptual domains, which appear to be a cross-linguistic rather than a language-specific phenomenon, are carried out by means of metaphors. Metaphors are understood as transfers, where properties from one concept are transferred to another, and in this way, it is how they 'allow us to understand one domain of experience (target) in terms of another (source)' (Lakoff & Johnson 1980:135). In the case of perception verbs, it seems that these metaphorical mappings take place between two domains: the vocabulary of physical perception (concrete source domain) and the vocabulary of internal self and sensations (abstract target domain). And for the particular case of tactual verbs, between physical touching and emotion.

However, if we review the different meanings that tactual verbs can convey in English, it is found that these verbs map not only onto the field of emotions, but onto other semantic fields as well. For instance, in English, the verb *touch* can be used to express 'partake, eat or drink' as in (1):

(1) *John hardly touched his food*

The same verb can also appear with the meaning 'reach' as in (2):

(2) *John touched the highest point in his career*

Another meaning is also possible, that of 'deal with' as in (3):

(3) *John touched that topic in the meeting*

And in a sentence like (4),

(4) *John touched Mary*

more different interpretations are possible. It is important to notice that still in the physical concrete domain, this sentence is ambiguous; (4) can mean either that John simply touched Mary, for example, on her shoulder, in which case the action of touching is merely a physical contact, or that this contact can have an effect on Mary; for instance, Mary, who did not notice John approaching her, when she felt the contact, shivered a little bit. But on the other hand, if this sentence is understood metaphorically, then the effect on Mary is no longer a shiver, but an emotional, abstract one.

Therefore, it seems that tactual verbs not just extend their meanings toward the emotion field, as Sweetser proposes. Meanings such as 'deal with' and 'reach' are also possible. These examples also point out the fact that extensions of meaning do not necessarily shift towards the abstract domain; they can remain physical, as in (1). This is why it can be said that tactual verbs are polysemous.

However, the issue in this paper is whether the polysemous senses proposed above are to be considered the result of the different senses of a polysemous verb such as *touch*, through an interaction between the semantics of the verb and that its arguments, or whether it is the choice of a particular type of argument that really determines the different meanings. In the following section, the treatment that polysemy receives in Cognitive Linguistics is revised in order to determine whether this approach is enough for its explanation.

2. POLYSEMY AND COGNITIVE LINGUISTICS. Within this framework, polysemy is defined as a systematic relation of meanings (Lakoff 1987:316; Johnson 1987:193).

When speaking about polysemy, the fact that we are dealing with multiple meanings is not the main point. Rather it is the fact that those multiple meanings are related not in an arbitrary but in a systematic and natural way.

According to Lakoff (1987), polysemy has to be understood as categorisation, that is to say, the idea that related meanings of words form categories and that these meanings bear family resemblance, an idea introduced by Austin (1961). Taylor (1995:108) explains this family resemblance category in terms of 'meaning chains'. A lexeme can convey different meanings A, B, C, D, … A is related to B in virtue of some shared attribute(s) or other kind of similarity. Meaning B in turn becomes the source of a further extension to meaning C and so on. This 'meaning chain' can be represented in (5), where any node in a meaning chain can be the source of any number of meaning expressions:

(5) A → B → C → D…

Taylor compares these 'meaning chains' to Lakoff's 'radial categories'. A category is structured radially with respect to a number of subcategories: there is a central subcategory, defined by a cluster of covering cognitive models. In addition, there are noncentral extensions which are not specialised instances of the central subcategory, but variants of it. The extensions of the central model are not random, but motivated by the central model plus certain general principles of extension. One of the advantages of this approach, if compared with classical models, is that it offers adequate means of characterising the situations where one or more senses are central or more representative.

Polysemy is then, the result of the extension of Idealised Cognitive Models (henceforth ICM)—complex structure wholes, gestalt—to form radial categories. Sometimes, a single ICM can be the basis for a collection of senses that form a single natural category. For instance, the ICM of the lexeme window can take three meanings; 'an opening in the wall', 'a frame fitting into the wall' and 'the glass filling the frame fitting into the wall'. These three senses are not unrelated. They form a natural category of senses, where correspondences remain physical. These correspondences have been explained in terms of image schemata, i.e., recurring structures of, or in, our perceptual interactions, bodily experiences and cognitive operations (Johnson 1987:79).

In some other cases, these correspondences do not take place within the same ICM, but between the ICMs of two domains. As has been pointed out before, Lakoff and Johnson (1980) proposed conceptual metaphor, the experientially based mapping from an ICM in one domain to an ICM in another domain, as one of the means for relating the different senses of a word; as well as other mappings such as metonymical and symbolic models.[2]

Although the usage of metaphor as a primary cognitive function (Johnson 1987) is agreed, it is argued that metaphor alone is not enough to account for the different senses that a lexical item can convey. On the one hand, some of these meanings are physical and therefore, cannot be accounted by means of metaphor. And, on the other hand, in many cases the transfer of meaning is not due to the tactual verb itself, but to the meaning of its arguments.

As Cognitive Linguistics does not seem to focus on this issue, it would be very enlightening to review other approaches that tackle those cases where the arguments of the verb play an important part in the shift of meaning. Such an approach is Pustejovsky's (1995) Generative Lexicon. In this model, within the characterisation of the semantics of the lexical item, a verb in this case, it is possible to include the information implied by the arguments of the verb and therefore, to show how the overall meaning of the sentence is formed. It is to this approach and its application to the different meanings of tactual verbs that we turn to in the next section.

3. POLYSEMY AND THE GENERATIVE LEXICON. The 'Generative Lexicon' is Pustejovsky's (1995) approach to the problem of lexical ambiguity, to the multiplicity of word meaning and to the question of how we are able to give an infinite number of senses to words with finite means. The main thesis of this approach is that a core set of word senses is used to generate a larger set of word senses when individual lexical items are combined with others in phrases and clauses. For instance, in the case of verbs, the extensions of meaning are achieved by the combination of the verb with its arguments.

Based on Weinreich's (1963, 1964) classification of polysemy, Pustejovsky distinguishes between 'contrastive ambiguity' (traditionally, homonymy) and 'complementary ambiguity' (when lexical senses are manifestations of the same basic meaning of the word as it occurs in different contexts) Complementary ambiguity is further subdivided depending on whether the category of the lexical item changes or not; this latter case, called 'logical' polysemy (cf. 'constructional' polysemy, Briscoe & Copestake 1991; Copestake & Briscoe 1996), is the one that interests us in this paper.

In order to account for polysemy, Pustejovsky proposes a characterisation of lexical entries in four levels of representation: argument structure (specification of the number and type of logical arguments and their syntactic realisation), event structure (event type of a lexical item and phrase), qualia structure (binding between the argument and the event structures; models of explanation) and lexical inheritance structure (how a lexical structure is related to other structures in the type lattice). These levels are connected by generative devices (type coercion, selective binding and co-composition) that provide the compositional interpretation of words in context.

So, for example, a sentence like (1) before would be represented as follows:

(1) *John hardly touched the food*
ARGSTR = [ARG1 = $\boxed{1}$: human]
[ARG2 = $\boxed{2}$: physobj (TELIC = eat)]
[D-ARG = $\boxed{3}$: how]
EVENTSTR = [E1 = e_1: activity]
QUALIA = [FORMAL = partake (e_1, $\boxed{1}$, $\boxed{2}$, $\boxed{3}$)
[AGENTIVE = touch_act (e_1, $\boxed{1}$, $\boxed{2}$)

The verb *touch* in (1) is associated with three arguments: two TRUE[3] ARGUMENTS and a DEFAULT[4] ARGUMENT, each argument is given a boxed number, called 'tags' (Pollard & Sag 1994), that indicate how the information is shared between these arguments and the qualia. The verb is analysed as an activity, as shown in the EVENT STRUCTURE. Both the ARGSTR and the EVENTSTR are bound by the QUALIA. The activity is identified as that AGENTIVE act of 'touching' involving the subject ARG1 and the object ARG2. The FORMAL role expresses the activity of there being such an object ARG2, whose role and function is expressed by its TELIC quale, and a D-ARG that tells us about the manner in which the activity was performed.

A problematic example is (4), where two unpredictable interpretations are simultaneously inferred.

(4) *John touched Mary*
ARGSTR = [ARG1 = $\boxed{1}$: human]
[ARG2 = $\boxed{2}$: human]
EVENSTR = (a) [E_1 = e_1: state]
(b) [E_1 = e_1: activity]
(c) [E_1 = e_1: activity]
[E_2 = e_2: result]
RESTR = $<_{\alpha}$
QUALIA = [FORMAL = affected (e_2, $\boxed{2}$) (Only in (c))
[AGENTIVE = touch_act (e_1, $\boxed{1}$, $\boxed{2}$) ($\boxed{2}$ not in (c)).

In this example, the verb *touch* has only two TRUE ARGUMENTS. The EVENSTR in (4) is more complicated than that in the previous example, as there are three options. In (a), the verb is understood as a state in which case, the AGENTIVE act involves the subject ARG1 and the object ARG2. This interpretation can be paraphrased as John being next to Mary. In (b), the verb is taken as an activity in the EVENSTR, which also results into an AGENTIVE quale that involves the subject ARG1 and the object ARG2. Finally in (c), the verb is analysed as an accomplishment, containing two subevents, an activity (e_1) and a result (e_2). The order in which these subevents occur is restricted by the relation of 'exhaustive ordered part of' represented by $<_{\alpha}$, where e_1 and e_2 are temporally ordered such that the first (e_1) precedes (e_2), each is a logical part of the event and there is no other event that is part of it (see Pustejovsky 1995:69). In this case, the AGENTIVE act of 'touching' involves only the subject ARG1, this AGENTIVE role is bound to e_1 (activity), whereas the FORMAL quale expresses the result of that activity, e_2, and the object ARG_2, that has been affected by such an activity upon which the result has been inferred.

The problem in this example lies in the fact that it is not possible to characterise in any way the difference in meaning between physical and abstract/metaphorical touching. This ambiguity is not present if the EVENSTR is (a), namely, when E_1 is a state and it is understood that Mary is adjacent to John; but in those cases when the EVENSTR is either (b), i.e., Mary can touch John physically or metaphorically, or (c), i.e., Mary can affect him physically (making him shiver, for instance) or metaphorically (feelings). The semantic characterisation for both arguments and the verb *touch* under this model is the same, whether the reading is physical or abstract; however, it is very clear that they are two different interpretations that must be accounted for separately. Unfortunately, this model does not seem to have a solution for either explaining how these two meanings are inferred or solving this ambiguity by means of semantic characterisations. It could be argued that the possible metaphorical readings could be listed somewhere in the QUALIA, but it is not clear how this would work in cases like (c), where the same arguments and event type produce two unpredictable interpretations.

4. AN ALTERNATIVE VIEW. It seems that neither of the approaches reviewed in the previous sections offer a complete explanation for the polysemy in tactual verbs. Whereas Pustejovsky's model accounts for some of the main central meanings of this semantic field, i.e., physical meanings like 'partake, eat', it fails when it comes to explain more metaphorical meanings such as 'affect'. The different levels of representation for the different types of lexical information in his model cannot describe how these specific meanings are achieved. Cognitive semantics, on the other hand, does not share this problem, as it recognises metaphor as the means by which these abstract meanings are conveyed. However, there are some shortcomings in this model too; this model does not explain how those physical extended meanings are achieved and does not explore to what extent the arguments selected by the verb influence the resulting interpretation. Another question unanswered in both approaches is the reasons why these domains are linked together; in other words, why tactual verbs develop these extended meanings.

In this section, an alternative view that solves these problems is presented. It is argued that some of the meanings are in fact compositional and achieved by the semantics of all the lexical items in the sentence as Pustejovsky suggests, but the explanation of such meanings when they are not physical can only be explained by metaphorical mappings as Cognitive Semantics proposes.

Therefore, the semantic extensions discussed in Section 1 for tactual verbs are classified according to the influence that the choice of arguments has on each case. In an ambiguous sentence like (4) 'affect', there are two simultaneous interpretations that cannot be predicted by the semantic properties of the arguments alone, and thus, they must result from separate senses of the verb *touch*; these extensions will be called 'semantic changes' because their interpretation is not predictable by means of the choice of arguments. In other cases, such as (1) 'partake, eat' and (2) 'deal with', the choice of a specific argument leads to a specific predicted extension; however, the influence of the semantics of the arguments is not the same in both examples. Whereas in cases such as (1), the extension is mainly determined by the argument *the food*, in meanings like (2), it is the verb that governs the choice of arguments and meaning. The former case is called an 'argument-driven extension' and the latter, a 'verb-driven extension'.

Although three different types of semantic extensions have been proposed so far, it is important to notice that all these meanings must have something in common in order to be extended from the physical sense of touch. Otherwise, it will be impossible to say why other sentences like (5) below are ruled out.

(5) **I touched the joke*

The reason why this example is not felicitous[5] when no context is given lies in the fact that *the joke* is not a 'touchable' type of concept, i.e., a joke cannot be touched in any abstract possible way as a topic is in example (3) above. From a cognitive linguistics point of view, the fact that *the joke* is not licensed with the verb *touch* stems from the way we experience this sense in our lives, in the human embodiment of this sense (Johnson 1987). Therefore, it is argued that all these meanings must fulfil the 'verb property requirement' in the case of tactual verbs 'touchable'. That is the verb arguments must be able to touch, if they are subjects, or be able to be touched, if they are complements. This requirement seems to be acknowledged by Pustejovsky in the example when he discusses *read* and *book*. In order for the representation of *reading* to be considered well-formed, it is necessary to have a complement not only containing information but also being propositional, i.e., a complement that is 'readable'. Pustejovsky solves this requirement by making reference to the dotted argument x.y[6] in the qualia, apart from the FORMAL definition of the relation between arguments (1995:96). In my view, this requirement should be present in all cases, as it has been seen that even in those examples where the semantics of the arguments are more important in the extension of meaning, they all must fulfil the 'verb property requirement'.

5. CROSS-LINGUISTIC DATA. One of the main points in Sweetser's study is the fact that these semantic changes are cross-linguistic rather than language specific. In the previous section, it was argued that the only semantic change that takes place in the tactual field in English is the meaning 'affect', because it is impossible to predict when the physical meaning or the metaphorical meaning must be inferred. Notice the use of the label 'affect' for this mapping instead of the emotional feelings

Sweetser proposes; this is because emotions are considered the metaphorical extension of those physical effects described before. If semantic changes are to be considered cross-linguistic, it is necessary to see whether the same semantic change occurs in the other two languages of the sample. A sentence like (4) above can be expressed in the following way in Basque (6) and Spanish (7) respectively:

(6) *Jonek Miren ukitu zuen*
John.ERG Mary.ABS touch aux
'John touched Mary'

(7) *Juan tocó a María*
John touched to Mary
'John touched Mary'

In both languages, the only possible interpretation of (6) and (7) is the physical reading. In these sentences, it is understood that John physically touched Mary. In no way can they have the metaphorical ambiguity that exists in English. This is not to say that it is impossible to express the metaphorical 'affect' reading in these two languages with tactual verbs. See, for instance examples (8) in Basque and (9) in Spanish:

(8) *Jonek Miren hunkitu zuen*
John<he>.ERG Mary.ABS touch aux
'John touched Mary'

(9) *Juan le tocó el corazón a María*
John <she>.DAT touched the heart to Mary
'John touched Mary's heart'

In Basque as well as in Spanish the mapping between the physical domain of touch and that of 'affect' is allowed as well; but in order to reach this meaning Basque requires a different verb, as in (8). In Basque, the verbs *ukitu* and *hunkitu* are etymologically related (see Michelena 1990). In general, however, *ukitu* is more widely used for the physical contact and *hunkitu* is usually restricted to the abstract interpretation. Nevertheless, both verbs can also be used in the other way, provided that an adjunct or argument specifies that we are using our hand for the touching, as in (10), or that the subject is non-physical, as in (11).

(10) *Eskuaz hunkitu diot*
hand.INST touch aux
'He touched him with his hand' (Aulestia 1989)

(11) Zure hitzek sakon ukitu naute
your words.ERG deeply touch aux
'Your words touched me very deeply'

In Spanish, it is necessary to add a complement that denotes feelings, as in (9) above. The direct object in (9) *the heart*, is understood not as a physical object; under the cognitive approach, *heart* is a metaphorical realisation of the image schema of a container, where HEART IS A CONTAINER FOR FEELINGS (Lakoff & Johnson 1980). In fact, as Moliner (1983) points out, in Spanish the verb *tocar* needs expressions such as *el corazón* 'the heart', *el amor propio* 'one's own pride', or *la dignidad* 'dignity', in order to infer this interpretation.

On the basis of these examples, it seems that what it has been referred to as 'semantic changes' in this paper, i.e., unpredictable meanings, are language specific. In English, a sentence like (1) is open to various interpretations, disambiguated only in a more specific context; in Basque and Spanish, the same ambiguity does not hold. Therefore, what is cross-linguistic is not the 'semantic change' but the mappings between different conceptual domains of experience.

6. CONCLUSIONS. In this paper, the role that the semantics of verb arguments plays in the overall meaning of the sentence has been discussed. Neither of the two approaches reviewed offers a sound explanation for all the semantic extensions in the field of tactual perception. Whereas Cognitive Semantics proposes metaphor as the main instrument for semantic extension, it has been seen that metaphor alone cannot account for physical extended meanings. Another problem for this approach lies in the influence that verb arguments can have on the overall meaning of the sentence. This influence is not taken into account. On the other hand, although Pustejovsky's model does look at the compositionality of meaning, this model is unable to explain how metaphorical meanings are conveyed.

Therefore, it has been argued that in all different meanings the interaction between the verb and its arguments is important, but to different degrees of compositionality. That is to say, in some meanings, the role played by the arguments of the verb is crucial. In some other meanings it is the verb that governs the choice of arguments and meaning. These cases are predictable polysemous meanings. Finally, there is a third class of meanings, where interpretation is not predictable by means of the choice of arguments. These are semantic changes.

Based on data from three different languages, it has been seen that what it is called here semantic changes are to be considered language specific cases. The possibility of mapping between different conceptual domains is what is regarded as cross-linguistic phenomena.

[1] I wish to thank Ronnie Cann, René Dirven, Aaron Drews, Marinanna Chodorowska-Pilch, and the LACUS Forum reviewers for their help and comments. I would also like to thank the LACUS Conference organisers for their financial support. Preparation of this article was partly supported by grant BF198.71 from the Basque Country Government's Department of Education, Universities and Research.

[2] For a full account of different types of ICMS, see Lakoff (1987:281ff.)

[3] TRUE ARGUMENTS are syntactically realised parameters of the lexical item.

[4] D-ARGS are parameters which participate in the logical expression of the qualia, but not necessarily expressed syntactically.

[5] This example is accepted if it is used negatively and in a very specific context, as when, for instance, we say *Don't touch that joke when you make your speech before the committee*. However, if this example is analysed internally, i.e., without any context, then it is no longer possible. (I owe this insight and the example to the LACUS Forum reviewers).

[6] A dotted argument x.y is the representation of a 'lexical conceptual paradigm (lcps)', i.e., the encoding of the regularities of word behaviour dependent on context.

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* * *

MONOSEMIC *TAKE*

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The verb *take* is an intriguing example of apparent multiple meaning, ranging from empty abstraction in *take a nap/a bath/a walk/place/root/rise/shape/hold* to specific concrete meanings 'grasp/grab/catch/remove/steal/win/choose/assume/require' and others. I present here part of an ongoing comprehensive study (on all uses of *take* in 10,000+ data) exploring the hypothesis that the diverse senses are the specifics of a single abstract meaning: *take* as general monoseme. I take as inspiration an article on *take* by Norvig and Lakoff (1987) [hereafter: nl]. Though my research was underway when I first read nl, it took immediate command of my procedures, serving as both guide and agonist.

Against dictionary hyponymy, nl argues for a polysemic *take* in a cognitive network (part of general knowledge), in which new senses develop as minimal changes in the form of concrete, figurative 'image-schemas' (nl:195). But order is partial: nl rejects monosemy (calling it an Abstractionist view) because generalizations (implied regularities) do not hold; *take a look/whiff* and *take a picture* 'photograph' are good but not **take a stare/smell* and **take a painting* 'to paint'.

nl includes insights that correctly fault views of meaning exclusively formal. While my approach too is formal/abstract, nl's functional/concrete views are crucial to my claims (though the combination may seem confusing at first). To locate myself, I assume a network like nl's. I agree that there are prototypes and image schemas. But I disagree with the claim that prototypes are basic meanings; if we make them such, we get theory-created irregularity.

My main difficulty with both formal and functional views is that too much meaning is attributed to words. I take the basic functional question to be: What do the contexts of human experience, and our knowledge of such, do that language (lexical meaning) consequently need not do? I want to make it plausible that *take*'s many meanings are due to its contexts (which vary), not the verb (which does not).

nl begins its proposal with the prototype (1), *take* meaning 'grab',

> 'from which the other senses of take can be represented most economically in terms of minimal variation links… Moreover, speakers intuitively judge this sense to be the most basic, and dictionaries reflect this judgment' (nl:198)

(1) The baby took the toy from its mother.
(2) The messenger took the book to Mary.
(3) John took the book to Chicago.
(4) I took a punch at him.
(5) I took a punch from him.
(6) Sam took Sadie to the movies.
(7) I took a glance at John.

NL provides the following specifications:

(1)' Subject *baby* is also agent and recipient; subject receives patient *toy* (default: small physical object) from source-person *mother*. Patient moves, controlled by agent, from origin to destination.
(2)' From (1): direction is reversed; agent-subject is not recipient. Agent must move with patient.
(3)' From (2): destination-place instead of recipient-person.
(4)' From (2): patient-object becomes patient-action. *At* instead of *to* implies Destination not reached.
(5)' From (4): direction is reversed, subject now nonagent recipient.
(6)' From (3): patient is a person, destination an activity; agent-subject goes with patient, may take part in the activity.
(7)' From (1): the small patient is instead a brief action: *take a glance*, but **take a stare*.

I accept several of NL's claims: speakers think first of 'grab'; dictionaries list this sense as basic; and children learn it early. As I find too, speakers who are asked what *take* means 'in isolation' ('by itself') are likeliest to assume the context specified in (1)'. I can also accept as operations of thought the particular schemes used to describe the changes.

Among my concerns, the one with the greatest ramifications is that NL's variations are not really minimal. Calling them minimal establishes a divided polysemic space by fiat; we are able to see only narrow hallways and cubicles. A more minimal test asks if 'grab' is the only meaning that *take* evokes in (1). For some babies, ages and interests, 'grab' is too forceful, maybe even too fast. By using modifiers to get hyponymic variants for (1), we find a wider range:

(8) The baby didn't really want the toy, but eventually took it from its mother.
(9) The baby reluctantly took the toy from its mother.
(10) The apprehensive baby took the toy from its insistent mother.
(11) The baby slowly took the toy from its mother.
(12) The baby finally took the toy from its mother.

These imply to me 'passively accept', outside the range of *grab*. 'Grab' also suggests 'in the hand' (13), which does not fit *head/wrist/nose* in (14). The meaning of *take* must cover (15) too. Ludicrous, unlikely or hard to imagine descriptions can be linguistically meaningful.

(13) The baby took the toy in its hand from its mother.
(14) The baby took the helmet/watch/eyeglasses on its head/wrist/nose from its mother.
(15) The baby took the toy refrigerator/vacuum cleaner /minibar in its teeth/ear/arms from its mother.

The hyponym test I adopted assumes that all combinations of (16) are hyponyms of take:

(16) [*Take* + Modifier].

However, while correct, this test cannot make complete systematicity the only consideration. *Take*-type modifiers qualify it in some way. Applied as a totalizing requirement, (16) can preclude the special properties of prototypes and figurativity. The formal system does not account for everything; it cannot define the body part limit to heart in *take it to heart*. It also treats (17) as just another sentence:

(17) The quick brown fox jumped over the lazy dog.

Conversely, special status does not negate systematic place; (17) is a system sentence too. Prototype (1) is still a superordinate to the modified sentences. The *take* monoseme is modulated by context in many ways and for many purposes, with variant degrees of salience, frequency and usefulness. A monoseme is realized, not replaced, by variation; it defines the general space for more specific senses.

The cognitive enterprise of which Lakoff is a major participant has corrected claims of completeness by theories that preclude prototypes like (1). But that enterprise in turn can preclude with the same reductive consequences. NL idealizes in a manner it rejects in formal theorists, considering [V NP PP] without related [V NP PP PP]. The general-specific relation of the former ((1), (3), (6)) to the latter ((18)–(20)) is precluded.

(18) The baby took the toy from the mother to the father.
(19) John took the book from Norfolk to Chicago.
(20) Sam took Sadie from the library to the movies.

Explicit *with*-PP parallels implicit motion in (2)–(3) and (6). 'Motion' is thus external to *take*.

(21) The messenger took the book (with him) to Mary
(22) John took the book (with him) to Chicago
(23) Sam took Sadie (with him) to the movies.

Generally, information provided by a PP can be implicit; thus NL must explore how its [V NP PP] relates to [V NP]. Dictionaries would gloss *take* in (24)–(26) as 'seize', 'choose' and 'steal', but the implicit material supplies much of the meaning:

(24) Josh took my bike (from me).
(25) The teacher took my poem (from all submitted).
(26) The thief took the jewels.

The implicit (elliptical, deleted) meaning comes from contextual contingencies. Autonomous syntax can allow 'recovery' of vague and redundant information because context can then be treated as inoperative; but all recoveries should be considered extralinguistic, recognizing that all implicit meaning can be provided by situation.

There is another range of precluded evidence that must be mentioned. As a prototype, (1) describes a situation we (think we) know well. Interpretation is effortless; meanings are salient, familiar, concrete; referents, roles and action are transparently clear. We know enough about what happens, even why or how; (1) is a comfortable sentence, high on any measure of 'ease of uptake'. These attributes serve to make it a prototype.

In contrast, (27)–(29) are less resolved, more puzzling. We don't know enough about what happens and so can't determine what the verb means. We cannot guess intelligently about the roles of undertaker, maid, dancer, photographer, dancer, and manager in these situations.

(27) The undertaker took the toy from the maid.
(28) The soldier took the toy from the photographer.
(29) The slim dancer took the toy from the manager.

With regard to ease of uptake, (1)–(7) communicate instantly, unconsciously; the language is transparent. (8)–(12) are less easy; interpretation involves more conscious effort and computation, though not as much as the complex sentences or Latinate expressions such as *superannuated canine*. The language used is more opaque. Examples (27)–(29) are even more difficult, but here language is not the problem. Computation cannot help; (27)–(29) need more information from human experience.

A fully adequate linguistic theory must explain these degrees of difficulty; the explanation must be both formal and functional. The needed insight comes succinctly and elegantly from Lakoff (1977:239).

A. The meanings of the parts constrain, but do not provide, the interpretation of the whole. The whole makes sense only because some aspect of the reader's experience has been evoked by the meanings of the parts.

The key notions are 'constraint' and 'evoke'. The formal system provides the first, the functional situation the second. This distinction is also that of semantic and pragmatic; of explicit and implicit; meaning of a word and of its contexts; meaning from language and from interlocutors-in-situation.

Some linguists (including Lakoff) reject the semantic-pragmatic distinction, which has been highly elusive. Yet, if we attribute all meaning to the verb, we collapse figure and ground in the figure, thus introducing another kind of precluding idealization and creating extensive polysemy. To make monosemy a plausible claim, I need to distinguish semantic and pragmatic. From (A), I have applied the following guidelines (with some redundancy):

B. Linguistic expression is both formal/semantic and functional/pragmatic.

C. A linguistic expression is composed of both semantic and pragmatic parts. How meaning is provided, part by part, is not obvious, cannot be intuited. The general range of potential specific meanings is also nonobvious and beyond intuition.

D. External effects cannot be formalized away. There is always a context. Expressions 'in isolation' contribute implicit salient context, all the more effective by being undetected. Uses supply context; citations and intuitions are uses.

E. The formal system cannot be functionalized away. There is always a difference between linguistic order and extralinguistic order; correlating the two, or combining them without distinction, simply minimizes the order of the formal system and biases toward functional diversity.

F. Since functional effects are in principle infinite, and most formal effects unconscious, what is formal cannot be fully intuited. No linguistic expression, however conceived, presents only the formal linguistic system. We have no direct access to the 'solely semantic'. The linguistic system must be inferred from its modulated irregular realization in expressions.

G. Two common assumptions turn out to be wrong: that intuitions are relatively reliable, and that intuition has access to the purely formal syntax/semantics. Isolating the purely semantic involves study of many details of many data.

H. Considering our habit of reducing figure-ground to figure, we can conclude that language provides much less meaning than we imagine. The semantic-pragmatic boundary eludes us because we have been looking in the wrong place, far into pragmatics.

I. We have no theoretical insights into what can and must be redundant in messages. What is provided semantically by other words or pragmatically need not be duplicated in a nonvarying word.

The semantic difference of *to*-pp and *from*-pp provides variant directions, making subject, agent and recipient sometimes identical, sometimes not. *Take* is unspecified for what prepositions provide or evoke.

Grab, *seize*, *choose* and *steal*—the words that appear in definitions and synonym lists for *take*—are its hyponyms. *Take* is more general: in (26), for example, the jewels may belong to the thief, who may not now be stealing.

Minimal variation applies not only to a sentence's more specific meanings, but also to its more general: superordinate, more abstract, expressions (1):

(30) The baby took the toy from her.
(31) Someone took it from her.
(32) Someone took it from someone.

Considering the details we have factored out of *take*, I abstract nl-patterns, from (1)–(7) to (33)–(39).

(33) 'grab'
(34) 'take Patient to Recipient'
(35) 'take Patient to Destination'
(36) 'take Action at Patient'
(37) 'take Action from Agent'
(38) 'take to the movies'
(39) 'take a glance at'

Abstracting again, we get (40)–(46) (where a = Agent, p = Patient, r = Recipient, d = Destination, s = Source, o =Origin):

(40) 'a/r take p from s/o', p = small concrete object
(41) 'a take p to r', p = small concrete object
(42) 'a take p to d' p = small concrete action
(43) 'a/r take p at r', p = action
(44) 'r take p from s', p = action
(45) 'a take p to d', p = person, d=activity

(46) ‘A take P at D’, P = brief action

Monosemy is not achieved simply by abstracting. If the remaining specifics of (40)–(46) are necessary in stating *take*’s meaning, then NL’s seven examples are still polysemic. Monosemy requires all patients (P) to exemplify some generalization, even if simply ‘no limit on what can be in this position’. Since agent and recipient each both occur as subjects and not, we need not put any limit on subject position for these roles; plus-minus values exhaust all possibilities.

NL’s criticisms of monosemy invoke standards that are too restrictive. NL requires plus-minus values to be fully parallel to be generalized; prepositions are not parallel in time and space. Yet, such a standard requires some developed assessment of parallelism. Do we in fact insist on perfect parallelism in general for all linguistic research?

Irregularities may be created by cross-effects: it can be argued that the time-space difference is external; the language adapts as well as it can to two different subclasses All subsumed specifics of some generalization may be available linguistically but have no use: a *take-in* restaurant. ‘Motion’ in (2), (3), and (6) is required and thus irregular in the set (1)–(7), but reality makes the requirement, not semantics. Some specifics are not used by everyone (dialect-specific *take and tell him*, *take a decision*) yet nothing in the language forbids these uses.

NL claim that subject and object are too abstract to be semantic categories. But if subject and object are the minimal generalizations in a context, then no semantic limits are set on *take* on those positions. Actually, I have found that all the arguments of *take* are what NL would consider too abstract.

In my study of *take*, I have reached the following tentative conclusions. I find that *take*’s full range of syntax needs at least eight arguments:

J. Syntax for *take*:

Subj	Verb	Obj	Source	Path	Goal	For	With	As
NP_S	*take*	NP_o	PP_x	PP_y	PP_z	PP_f	PP_w	PP_a

Subject-to-As designates categories equally abstract. The last three PP categories have only one member each.

The following P-chart roughly indicates which PP can be used in which categories:

K. PREPOSITIONS

DIMENSION					
	Source	Source		Goal	Goal
	Path	Path	Path	Path	Path
	Locative		Locative		Locative

0-1	of	from	by	to	at
1-2	off	off of	across	onto	on
2-3	out	out of	through	into	in

Other path-locatives: *up, down, over, under, above, beneath, around, past, via, between...*

The major task with *take* is accounting for all the phrases that are thought to be idioms (phrasal verbs). This verb is more systematic when redundant arguments (both full and part-whole, either PP or NP-object) can allow implicit modifiers. Also, a place is (as metonym) an NP or PP that starts or ends at it.

L. Examples of Goal = Subject

(47) I could take his pain on (myself).
(48) He took fresh air in(to his lungs).
(49) A trained ear takes sound patterns in(to itself).
(50) No family took guests in(to their home).
(51) The car can't take the box (in(to the rear)).

M. Examples of Source = Subject

(52) Mary took a pen out (of her pocket).
(53) She took her bitterness out (of herself) on her husband.
(54) 'I'll just take a peek (from myself) at the baby'.
(55) No one took an ax (from one's self) to the trees.
(56) She seemed to take a fancy (from herself) to Jay.

N. Examples of Object = Subject

(57) The airplane took (itself) off
(58) She had taken (herself) to bed to think
(59) We took (ourselves) to the road
(60) He took (himself) to crime like Caruso to opera.

O. Examples of Goal = Object

(61) I took the dress in (to itself).

P. Examples of Source = Object

(62) They took the doors off (of their hinges).

(63) She took the dress out (of itself).
(64) His voice took all my fear away (from me).

All of NL's examples fit two of these patterns: (1) and (5) are Subject = Goal; (2)–(4) and (6)–(7) are Subject = Source.

(1)" The baby took the toy from its mother (to itself).
(5)" I took a punch from him (on my arm).

(2)" The messenger took the book (from his place) to Mary
(3)" John took the book (from his place) to Chicago.
(4)" I took a punch (from self) at him.
(6)" Sam took Sadie (from their place) to the movies.
(7)" I took a glance (from self) at John.

There is less incompatibility between NL and me than might seem apparent. As in many disagreements, the parties are in different parts of a highly complex order. I should note another seeming difference: NL emphasizes figurativity and I ignore it. But we both find shortsighted any theory that has no place for it. NL's metaphors and metonyms are appropriate for the image schemas. We differ here only on *take*, which I find too abstract and general to be figurative.

Polysemy is monosemy diversified in pragmatic hyponyms on more concrete levels. NL attends to openended, ever new, concrete levels; I attend to the closed, long-established abstract levels. My part of the social division of linguistic labor is to keep the formal and functional polarities from eclipsing each other and the continuum they span. Meaning is our capacity for ordering the world; to comprehend it, we need more means and levels than we currently imagine.

What is easy and immediate for us has the extra complexity of being made such. Prototypes, I suggest, are the most complex simple meanings we know, the superstructural commonplace 'known world' created from language and experience. Prototypes represent consciousness: what is real to us, familiar, frequent, salient, natural, true. Prototypes can help us discover such things, but not basic order. Conscious awareness emerges from the unconscious; basic order in language is unconscious, perhaps even partly beyond knowing. By conflating prototypes and basic order, we diminish both thought and language.

I hope to have shown to some degree, using NL's method of minimal variation, that the seven patterns are evidence not of separate meanings but contextually modulated variants of one meaning, a verb of high abstraction. A full demonstration requires more than I can presently offer; inconveniently, the more general a claim, the more details to be taken into account. Many details, surprises, revisions remain.

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❧

ALMOST, AND COUNTERFACTUAL IMPLICATURES

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An area of infrequent analysis in past pragmatic research is the role of approximating or proximative adverbs such as *almost* and *nearly* in producing meanings of counterfactuality, and the place of such adverbs on an implicature scale of the nature of Horn (1972). From first appearances it would seem that there is no reason why proximative adverbs could not appear on such a scale, alongside quantifiers such as *some*, *most*, *few* and more precise indicators of quantity such as cardinal numerals. The function of such items appears to be comparable to that of the quantifiers in restricting a universal proposition, or in grading degree in some adjectives and other quantifiers. However, there emerges a clear difference: quantifiers like *some* conversationally imply the negative of a stronger proposition, by the observance of the Gricean Maxim of Quantity 1, while *almost* (and those akin to it) has been believed to contain negative entailments, for the reason that the relevant inferences are non-defeasible, making them unlikely candidates for implicature scales (see, e.g., Atlas 1984; Hitzeman 1992). The paradox which arises is that, as noted by Sadock (1981:257), the negation of the stronger proposition that *almost* restricts is not part of its semantic content, and yet this counterfactual proposition, in the majority of cases, cannot be cancelled.

The present paper aims to resolve the paradox, analysing the meaning of *almost* as a strong counterfactual implicature, and offering an account by which this and many other counterfactual meanings may be explained.[1] The argument for an implicature analysis for *almost* will be supported by revealing a predictive function for proximatives, similar to that of certain modal verbs, and comparison will be made with proximatives in other languages, which grammaticalize from the same crosslinguistic sources as predictive meanings. A factor to be considered is whether co-occurrence conditions will affect the interpretation of *almost*, and a small number of native-speaker intuitions will assess the grammatical distribution of *almost* in order to investigate whether contradictions, indicating entailments, can be found in all environments. It will be shown that the negative inferences assumed to be part of the meaning of approximators are actually strong counterfactual implicatures, their strength determined by means of a given Principle. The Principle is hypothesized to apply to a wide range of counterfactual meanings.

1. ARGUMENTS FOR AN IMPLICATURE ANALYSIS

1.1 PREDICTION. According to Sadock, it was possible to consider the denial of the truth value of the predicate of *almost* as a generalized conversational implicature based partly on its meaning, rather than an entailment (1981:261). Sadock had admitted that the cancellation of such an implicature out of context would be difficult, and not parallel to the kinds of cancellation applicable to *some/all* examples on the implicature scale of Horn (1972),[2] but that this was mainly because of the strength of the implicature. In order to provide evidence for the presence of an implicature and not an entailment, Sadock argued for a number of cases. One was the use of the conjunctor *but* in examples such as:

(1) He almost, but didn't quite, win the race.

This use is compared with the use of truth-functional equivalents such as *and*:

(1)' ?He almost, and didn't quite, win the race.

(1)' is considered inappropriate since, unlike *but* in (1), the use of *and* adds nothing to the meaning of *almost*. Sadock (1981:264) therefore assumed that *almost* implies the denial of his winning the race, and *but*, used in (1), is said to reinforce the implicature, adding more information. However, the conventionally implied meanings in *but* suggest that the conjunctor typically introduces a contrastive statement, so in (1), the possibility of his winning must also be contained in the meaning of *almost* for such statements to be appropriate. Sadock does not discuss this possibility, but *but*-clauses offer firm evidence for the implication of predictive senses in the proximative adverb. All past time reference uses of *almost* can be appended with a conjoining clause introduced by *but*, and, as well as adding more information, the conjunctor can be used in most cases to suggest a contrary turn of events; e.g.:

(2) She had almost sung Strauss's 'Four Last Songs', but she broke into a sneezing fit before she had finished.

Although Sadock refers to the use of *but* to reinforce the implicature of negation, it is questionable whether an implicature that is strong enough to be considered by some accounts to be an entailment actually still needs reinforcing. The use of *but* in (1) and (2) to conventionally implicate contrast, adversity, or unexpectedness is unlikely if the inferences surrounding the use of *almost* are that the predicated event did not occur anyway—just where does the contrast lie?

For this reason, it is likely that the relevant inferences are related to the Gricean Maxim of Quantity 2. The Gricean Quantity 2 Maxim (termed Q2 by Levinson 1995, or R-based by Horn 1984), in contradistinction to the Quantity 1 Maxim, is informationally upper-bounded, and may license the implicature that the speaker was inferring more information than was expressed. Q2 implicatures have been shown to influence the grammaticalization of predictive meanings from modal verbs historically (Traugott 1989), by the implicatures of future action resulting from present intentions, abilities, or permission. The use of a *but*-clause in examples such as (1) and (2) reveals the presence of similar inferences associated with *almost*. This offers strong evidence against the entailment hypothesis, which, if it is sustained, will require an explanation for such cases.

The predictive nature of *almost* in past contexts may therefore contribute to the irrealis meanings of counterfactuality considered to be negative entailments in some accounts. In the following section it will be seen that the proximative functions of *almost* are grammaticalized diachronically in other languages from verbs of volition. It is such parallels with volition verbs that enable a modal function to be suggested as attributable to the use of *almost*.

1.2 EVIDENCE FROM THE GRAMMATICALIZATION OF PROXIMATIVES. Although verbs of volition often form the sources for the grammaticalization of predictive future meanings, similar lexical sources have been found to grammaticalize into proximative meanings. Kouteva and Heine (1995) and Heine (1994) were able to isolate in their data from African languages and Bulgarian a volition verb with a corresponding grammatical function of marking proximity, that is, expressing meanings of 'nearly' or 'almost'. In a study of the grammaticalization of negative marking in Chamus, a Maa dialect of the Eastern Nilotic family, Heine (1992) illustrates a gradual chain of concepts: the lexeme *-yyéú* moves from being a main verb of volition with a noun phrase object, to an auxiliary-like verb with a main verb complement, and then to a grammaticalized, uninflected aspect marker with an inanimate agent as subject, conveying the meaning 'almost', and finally grammaticalizing to imply negation. Part of this chain is illustrated in (3):

(3) a. k-á-**yyéú** n-aâ
k-1SG F-food.ABS
'want food'

b. k-é-yyéú l-cáni n-é-uróri
k-3SG- M-tree.NOM NAR-3SG-fall
'the tree almost fell'
(Heine 1992:338–40)[3]

In (3)b the grammaticalized senses of proximity are well established, as is demonstrated by the presence of an inanimate subject not capable of expressing volition. The use of *yyéú* is now as an aspect marker, described by Heine (1992:339) as the ALMOST-aspect, but later renamed the *proximative* aspect in Heine (1994).

Other languages in which volitional verbs have provided the lexical sources for the proximative include Swahili, Mvua, and Ewe (ibid); and Heine (1992:342) notes that in Southern Soto, a Bantu language, the verb *batla* meaning 'seek', 'desire', or 'want' has developed into an auxiliary with a proximative aspect. Matisoff

(1991:394) notes that for Chrau (a Mon-Khmer language spoken in Vietnam), the verb *cornh* ('want to') can also function as a non-negatable, pre-verbal particle meaning 'almost'. It is of interest to note that not all of these attested examples have progressed to become negative markers, but that when the temporal reference is past, negative inferences also begin to appear as a meaning shift in a limited number of environments. This suggests the influence of the Maxim of Quantity 1, which implies the negation of the predicate proposition.

The arguments for the negative entailments rather than counterfactual implicatures resulting from the use of *almost* are further weakened by this cross-linguistic data, illustrating the gradual development of proximative inferences from volition verb sources via the strengthening of Q1 implicatures. Given such evidence, it is suggested therefore, that the senses of counterfactuality associated with *almost* in English may be similarly the result of the gradual strengthening of Quantity implicatures, and that both Q1 and Q2 implicatures may interact to determine proximative meanings.

2. CO-OCCURRENCE CONDITIONS. One of the arguments Hitzeman (1992) uses to justify an entailment analysis of *almost* is the contradiction suggested by *almost P* and *P* occurring co-temporally. However, Atlas (1984:348) argues that a sentence such as:

(4) Moore almost understood 'material object' and he understood it

is acceptable. The acceptability of (4) can hold if the proximity to the event and the event itself are considered co-temporal. Leech (1987:25) describes verbs such as *understand* as 'verbs of inert cognition', or 'unrestricted present', referring to mental states. As such, they should be easier to construe as situations which are homogeneously distributed over an indefinite time-span, and such temporally-unbounded environments cannot individuate the implied separate events required to create the contradiction necessary to ascertain an entailment account. Perhaps, then, in some environments *almost* produces a greater likelihood of contradiction than in others, suggesting that the negative inferences may in fact be graded in a continuum-like fashion according to varying strengths. It is possible to see that (4) does not appear so sharply contradictory as, for example, Sadock's (1981) example would appear:

(5) Bill almost swam the English Channel, and he swam it

when referring to the same event in both clauses. The reason for this is that *almost* usually refers to a point close to the boundary of the predicate it quantifies (as suggested by Heine (1994:36) referring to the proximative in African languages), and this point is more vaguely construed in imperfective situations such as (4).

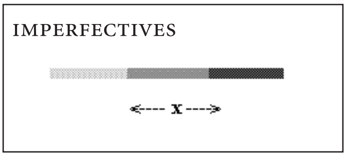

Figure 1.

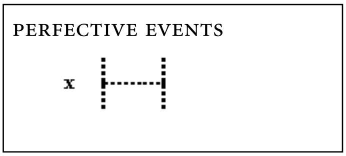

Figure 2

Langacker (1987:79) described the use of imperfective processes to refer to an extension of a stable situation through time, one with no inherent boundaries. Thus, the state of full understanding may not be conceptually distinct from any approach stages or states of approximate understanding which may overlap with it, and may not entirely contradict such states. (4) may be schematized then as in Figure 1, the centre shading marking the area of approximation which overlaps with the darkest area marking the (predicted) fully represented state. Grammatical imperfectivity, using the progressive aspect, can be similarly schematized, using an activity verb (see Vendler 1967), which is also inherently unbounded, as in *Bill was almost swimming* (see Figure 1). The center shading does suggest for expressions such as *almost swimming* that some action is on-going at reference time, which may overlap with and indicate a less representative instance of the state of *swimming*.

Punctual or telic achievement verbs, however, do not contain the possibility of grading indicating a part-whole relationship, since they are bounded in time, and the time span over which the event occurs is too brief to be considered as co-occurring with an approach phase. For this reason, the grading provided by *almost* is pragmatically determined by a time-scale, not semantically determined by the internal composition of the entity, and the approach stage is implied as occurring independently and outside of the bounds of the event. The representation of *almost* with a punctual achievement event; e.g., *Mike almost fell*, can be illustrated as follows, the cross marking the point of proximity, and the dotted figure marking a predicted event:

Because of the conceptualisation of an external approach point in Figure 2, accounts such as Hitzeman (1992) cannot consider the use of *almost* with such verbs unless the adverb refers to a time point outside the time at which the action did occur (if at all). The punctuality of many actions makes it impossible to perceive, for example, an event schematized in Figure 3, where the act of falling includes or is fused with the approach point. In reporting the conceptualization of a punctual event, the approach point is often not viewed as discrete from the result, and, furthermore, it would be conversationally uncooperative to report only the approach point without reporting the complete event, if known. It is for such reasons that proximative adverbs can be given an implicature account, rather than an entailment account.

Langacker (1987) also ranked perfective and imperfective verb types as direct notional analogues of count and mass nouns, count nouns being comparable to

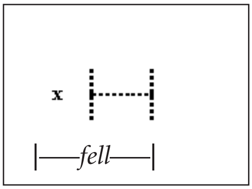

Figure 3.

perfective processes, and mass nouns to imperfective processes. If the use of proximative adverbs invokes a point close to a conceived boundary of a predicate, then a spatial boundary demarcated in the notion of a count noun should be amenable to approximation by *almost* in the same way as the temporal boundary demarcated by a perfective verb type. It is possible to use *almost* to refer to the count nouns Langacker terms 'interconnected entities', e.g., *team*, *constellation* and *alphabet*, since these refer to bounded entities which are compositionally distributed over a number of members. The grading of size then provides the internal scalarity needed for the use of *almost*; and the boundary relevant to approximation is the terminal one; e.g., in *We have* ***almost*** *a team here*; in which the quantifying expression may be diagrammatically represented as Figure 4.

Noun phrases with adjectival quantification can be similiarly represented, some gradable adjectives (e.g., *almost bald*—see (3)), as well as one reading of accomplishment predicates (the other is plotted as in Figure 2), in which the boundary to which the adverb approximates is the terminal boundary of the object of accomplishment (e.g., *the English Channel* in *Bill almost swam the English Channel*). (Again, the dotted boundary indicates a predicted, not an actual, demarcation.)

Almost may also occur with some uses of mass nouns, as in *This soup is almost water*, where it is implied that too much water has been added in the making of it, producing a substance which is partly water, partly soup. In such contexts, the mass noun *water* has been construed as having an approach point, in which the entity described by the mass noun is seen to partially overlap into the entity described by another mass term, *soup*, and is not discontinuous with it. This situation may be schematised, as in Figure 1, in which the approach marker *almost* may be used to indicate the direction in which the composition of the soup is heading, but the

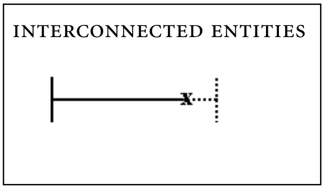

Figure 4.

approach phase and the resulting state are not totally discrete, since some of the resulting state may be construed as already present in the approach phase. The same situation can also be seen with some cases of non-gradable adjectives; e.g., *almost crazy*, where *almost crazy* is considered as partially overlapping with the absolute state, *crazy*, at the same time being a less representative instance of it. Such adjectives can also be diagrammed according to Figure 1.

Some entities cannot be schematised at all, such as a count noun referring to a non-gradable, physical object (e.g., *beagle*, in Hitzeman's 1992 example, *Martha has almost one beagle*). Such nouns cannot be given any kind of interpretation with *almost* unless they refer to created entities (e.g., *almost a cake*, which could be represented as in Figure 4). The reason why certain count nouns and bounded verbs are not direct analogues where approximation is concerned is that time provides the quantifiable scalarity necessary for the expression of an approach point with bounded verbs, and if the count noun has no inherent grading, there is no equivalent scalarity progressing towards a spatial goal without invoking temporal measurement as well. If temporal progression cannot be conceptualised, the expression is unacceptable.

The potential for the negative inferences to be cancelled then, appears to vary according to the environment in which *almost* appears, and with stative verbs, mass nouns, and other time-stable predicates, an approximate representation of their state provides a valid instance of that state without total contradiction of the full representation. The strength of the negative inferences associated with the use of *almost* are therefore hypothesized to be a factor of their co-occurrence conditions, varying according to the presence of conceived boundaries in the predicates over which they have scope. In order to test this hypothesis, a brief survey was conducted, investigating the extent of such variation perceived by individual speakers.

3. Testing the co-occurrence conditions. The survey consisted of a small number of sentences which were constructed on the basis of the points discussed above, and in which the variables were bounded and unbounded predicates. Unbounded predicates included a quantified noun phrase (sentence 1), a gradable adjective (sentence 2), and a lexically and grammatically imperfective verb (sentence 3). Bounded predicates included a physical object count noun (sentence 4), a past achievement verb (sentence 5), and a past accomplishment verb (sentence 6), both of the last two being grammatically and lexically perfective verb types. The respondents were presented with a group of sentences of the form *almost P, in fact P*, and asked to list those they thought were contradictory.[4] The number of example sentences was kept to a minimum to avoid the problems of weakening of judgement due to repetitiveness of the task. It was hypothesised that the first three sentences (1–3), in which the item quantified by *almost* was felt to be conceptually unbounded and internally-scaled would invoke weaker implicatures (which would be more easily defeasible) than the last three (4–6). If this were the case, the sense

Sentence	No./20	%
1.	11	55
2.	10	50
3.	12	60
4.	19	95
5.	15	75
6.	18	90

Table 1. Distribution of the assessment of contradictory sentences. (The number of respondents listing all sentences as contradictory was 9 out of 20, or 45%.)

of contradiction in sentences 1–3 would be predicted to be less obvious to the respondents than for sentences 4–6. The survey and results are summarized below.

(6) **The Survey Sentences**
1. Almost all, in fact, all of the wheat crop was saved.
2. Sam is almost bald, in fact he is bald.
3. When I saw Sue she was almost running, in fact she was running.
4. The animal in the cellar was almost a mouse, indeed it was a mouse.
5. John almost fell off the bridge, in fact, he did fall.
6. The dog almost crossed the road, in fact, it crossed the road.

The results are listed in Table 1.

The limited data clearly suggests that opinions vary as to whether or not a sentence with co-occurring *almost* P and P are contradictory, and that there is a general tendency for externally, temporally-scaled, bounded perfective verbs (sentences 5–6) to have higher evaluations of contradiction (75–90%) than internally-scaled count nouns, imperfective processes, or stative qualities (50–60% for sentences 1–3). (Sentence 4 showed neither internal scaling nor external, temporal scaling, and thus scored the highest.) The differences in the evaluations of contradiction indicate that an entailment reading of *almost* is not always present, suggesting instead the presence of counterfactual implicatures varying in strength according to environment and speaker intuitions. Given that temporally-bounded situations are more likely to be listed as contradictory according to the survey, it may be hypothesised that implicature strength increases in such environments; i.e. those of more specific conceptual distinction. The implications of such results are discussed in section 4.

4. DETERMINING IMPLICATURE STRENGTH. Lewis (1973:69) claimed that a counterfactual could not be asserted without a factual premise to back it. Thus, in past contexts, the counterfactuality of an expression is dependent on the speaker's

awareness of certain known facts to the contrary, otherwise, the meaning is considered merely hypothetical. A counterfactual implicature, therefore, is an inverse construal derived from accessible factual evidence.

The expression of a bounded, past perfective event is taken as having terminated and is therefore unalterable in the subjective viewpoint of the speaker. As a result, it becomes more highly factualized, and when co-occurring with proximatives, licenses stronger implicatures than a time-stable, stative verb phrase, to the point at which the implicature is interpreted as either conventionalized or an entailment. When *almost*, then, is used to quantify time-stable entities such as quantifiable nouns and stative verbs, it is more easily defeasible. When used to quantify realized past perfective events, it is not so defeasible since the realisation of a perfective event profiles the *termination* of the event, and *almost P*, which indicates the approach stage of an event, cannot be conceived as co-occurring simultaneously with the termination of the event *P* in the short time period in which such punctual events take place. The termination of the event, in turn, indicates a greater potential for factual recall by the speaker, since it has already passed at the moment of speaking. The enforcement of the implicature, then, depends only on the *potential* for the speaker to utter a statement about which true facts are known. As this potential increases, so the likelihood of defeasibility decreases.

The likelihood of the occurrence of an implicature in past contexts is therefore minimal, since we normally have facts about the past, and we do not need to derive pragmatic inferences for further information. An implicature, then, is simply not *anticipated* in relation to past contexts, or in similar information-rich situations. This situation can be summarized in the form of a single principle, which will be labelled in the present study the *Counterfactual Implicature (CI-) Principle*:

(7) **The CI-Principle**:
'The strength of an implicature is inversely proportional to the probability of its occurrence.'

In linguistic terms, this means that by increasing the information density of an utterance, an implicature will not be likely to form; therefore, in a situation in which the specificity and/or factuality of an utterance is expected to be greater, such as in past perfective contexts, an implicature will be improbable. However, the strongest counterfactual implicatures, such as are derived from predicates with *almost*, apply to past, perfective contexts, so when in an improbable context a counterfactual implicature does occur, it will be much more powerful than in a more probable context; in this way the pragmatic function is best preserved.

Environments with negation or with a first person subject were found in Ziegeler (1994 and 1996) also to produce the strongest implicatures of counterfactuality relating to conditionals and hypothetical complements, negation because of its marked nature, implying a relevant, corresponding positive expression (see

Horn 1989), and first person subjects as they are identical with the speaker and imply the highest level of evidential support for an utterance. Sadock (1981:265) observed that the cancellation of implicatures such as *some X* by *in fact, all X*, could not be so easily transferred to instances in which the expressed quantity was more specific: *?A fraction of, and possibly all, poodles have spots*. In such cases, the difficulty is due to the increased information density which lends the utterance a higher factual evaluation by the hearer. Givón (1994:310) questions the common appearance in subjunctive clauses of past and perfect forms, essentially realis morphology. The reason is that past and perfect forms express factually more specific concepts which are more amenable to abstraction by counterfactuality. The licensing conditions for a counterfactual implicature are therefore not the actual provision of factual information, but the hearer's assessment of the *potential* for one given situation to provide more explicit and more detailed information than another.

5. Conclusions. The present paper analyses the meaning of *almost* in terms of a strong conversational implicature (as suggested in Sadock 1981) of counterfactuality, and argues against the claims by Hitzeman (1992) and others that the proximative adverb is an entailment. Evidence for the implicature analysis comes from: (i) the fact that a negative entailment from *almost* would suggest a prediction, which is an expression of only possible truth, not actual truth, and which, furthermore, is derived by means of Q2 implicatures; (ii) the evidence of proximatives in other languages in which the meaning is grammaticalized via pragmatic implicatures from the same crosslinguistic sources as derive predictive meanings; and (iii) the variation with which contradictions are assessed by native speakers when *almost* is used in different grammatical environments. The negative inferences associated with *almost* can be seen to be non-defeasible in many instances, but can be more easily cancelled when quantifying unbounded, internally-gradable entities and states. The phenomenon of increasing and decreasing implicature strength is a factor of the potentiality provided by the context for generating an implicature, and this is summarised in the CI-Principle. The effects of the Principle are clearly seen in the behaviour of *almost* in different contexts, as shown in the data from a small survey.

While the Principle has been shown to be most effectively applied to counterfactual situations in the use of *almost*, it is not to suggest that it may be limited in the extent of its application to such contexts. The obvious next task is to test the Principle in other counterfactual domains such as conditionals and complement clauses. Further investigations may also look to finding more precise and principled means of predicting pragmatic inferences generally. Such tasks present a challenge for future endeavours in the field.

[1] The definition of counterfactuality is to be understood here as determined only by speaker knowledge: a counterfactual utterance can be made only in cases where the speaker has full knowledge of facts contrary to the hypothesised proposition; in all other cases the meaning is merely hypothetical.

[2] Such scales are termed 'Horn-scales' by Atlas and Levinson (1981).

[3] Heine notes that in these examples the function of the prefix *k*- is unclear.

[4] The form *almost P, in fact P* could be understood by the reader as a self-correction of an utterance. However, this form has been used because it also serves typically to cancel implicatures in scalar expressions, e.g., *John ate some, in fact all of the cake.*

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V. DISCOURSE & PRAGMATICS

SI QUIERES AS A GRAMMATICALIZED POLITENESS MARKER IN PENINSULAR SPANISH

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Various studies (Östman 1981; Stubbs 1983; Schiffrin 1987; Fraser 1990; Maschler 1994; inter alia) have considered pragmatic functions of discourse markers (DMs) in English and other languages.[1]

This paper examines the use of the deverbal marker *si quieres* 'if you please' (literally, 'if you want') in utterances that require mitigation.[2] The main goal is to analyze its non-canonical use in natural conversations and to determine systematic contexts of its occurrence. For this reason, examples similar to (1) and (2) will be considered.

(1) Eso te lo puedes llevar *si quieres*.
'You can take it *if you please*'

(2) Pues, *si quieres*, casi mejor pasarse esta tarde ¿eh?
'Well, *if you please*, it's even better to stop by this afternoon, OK?'

In (1), a travel agent attenuates the impositive force of an offer, and in (2), another agent mitigates a suggestion. Both examples demonstrate that *si quieres* is used as a DM which conveys speaker's (S) polite attitude towards his/her addressee (H). Such use of *si quieres* seems to invoke Brown and Levinson's (1978) concept of face as well as Lakoff's (1973) politeness rules, and Leech's (1983) Tact Maxim. As opposed to the standard politeness marker *por favor* 'please', *si quieres* focuses on the benefit or interest of the H, and may be used only in specific speech acts.

In this study, *si quieres* is considered an 'interaction marker', a type of DM (see Sankoff et al. 1997), whose function is to encode speaker's (S) attitude towards addressee. Also, going beyond Montolío's (1992, 1993) accounts on the use of the conditional structures in Spanish, it is argued here that *si quieres* is a grammaticalized politeness marker in offers and suggestions. Unlike various accounts (cf. Schiffrin 1987; Fraser 1990; and Traugott 1995b; inter alia), this study highlights the metacommunicative function of DMs as opposed to the textual one.

1. *SI*-CLAUSES. Before we proceed with the analysis of *si quieres*[3] which functions as a politeness marker only in certain impositive speech acts in Spanish, it is necessary to recall some considerations from previous studies (Levinson 1983; Dancygier 1990; Sweetser 1990; Prieto de los Mozos 1992; Montolío 1992, 1993; Geis 1995, to mention the most relevant) which have led us to the observations presented here. In general, these accounts deal with the functions of *if*-clauses or speech-act conditionals.

With regard to English, Levinson (1983:266) observes that *if*-clauses may occur in requests or indirect requests, but not with direct or indirect questions. He also indirectly alludes to the grammaticalization of certain syntactic constructions motivated by specific pragmatic principles (Levinson 1983:267). The last allusion as well as the studies carried out by Traugott (1996) and Kay (1997) lead to the conclusion that some 'formulaic' expressions in different languages may undergo similar evolution. Here, we argue that Spanish *si quieres* is a grammaticalized politeness marker in offers and suggestions.

Furthermore, despite the surface structure of *si quieres*, the use of this construction does not rest on the use of true conditionals (*if p then q*), but rather on felicity conditions of the performed illocutionary act, as mentioned by Levinson (1983). It will be demonstrated that the felicitous acts involving *si quieres* are not contingent upon truth conditions but rather upon principles of politeness.

Geis (1995:144) calls similar *if*-clauses (e.g., *I would like a hot chocolate if you don't mind*) 'politeness conditionals', proposing that they are present 'in order to redress the negative face-threat associated with the request'. Similarly, *si quieres* mitigates the impositive force of a speech act, by invoking Brown and Levinson's (1987:172) strategy 'Don't coerce H'. In our view, the function of polite conditionals (a sub-type of metalinguistic conditionals) is mainly to reduce the unwelcome illocutionary force of utterances (cf. Sweetser 1990).

Si quieres should also be considered an interpersonal marker (see Maschler 1994), since it seems to establish metaphorically a relationship between the S and his/her interlocutor/s by referring to the presence of him/her/them. Thus the origin of this marker is clearly prompted by its canonical/referential meaning. In fact, Sweetser (1990:131–32) also notes that one of the factors which makes a speech act with a conditional-like protasis more polite is the conditional structure which produces a less assertive reading of the metalinguistic conditionals than their non-conditional counterparts.

With regard to *si quieres*, the nature of *querer*—a desiderative verb—seems to be crucial as well. However, *si quieres* used as a politeness marker appears to have lost some of its referential meaning in impositive contexts. This would seem to indicate grammaticalization of the construction as a discourse marker (Traugott 1995b, in press). Also, the encoded subjectification of *si quieres* is another proof of context-induced inferencing (ibid 1995b); the marker conveys S's polite attitude towards H.

Turning to studies on Spanish, Polo (1971), Alcalá Alba (1979), and Prieto de los Mozos (1992) have already put forward some intuitions about conditionals in Spanish, but only Montolío (1992, 1993) gives them more detailed attention. In both studies carried out by Montolío (1992, 1993), one of the forms of 'metadiscoursive'[4] conditionals is a type of protasis which addresses politeness rules and/or principles (Lakoff 1973; Leech 1983, respectively), as in, ***Si me permite****, yo bajo en la próxima* 'If you allow me, I will get off at the next (stop?)', or ***Si no te importa****, acércame ese cenicero* 'If you don't mind, can you pass me that ashtray?' (Montolío 1992:456).

Montolío does not elaborate on the grammatical nature of the *si*-constructions and the type of speech acts in which these 'polite protases' may be used. Based on examples presented by Montolío (1992:456; 1993:130–34), only *si*-clauses with a limited number of verbs (e.g., *permitir* 'to allow') and some lexical expressions (e.g., *si puedo interrumpir* 'if I may interrupt') may be employed in polite conditionals. Furthermore, in her account these expressions seem to be used only in indirect requests.

In contrast to Montolío, our analysis will demonstrate that *si quieres* is an interpersonal discourse marker which serves to mitigate impositive speech acts, such as offers and suggestions. In addition, patterns of the use of *si quieres* and contexts of its occurrence will be set up.

2. POLITE USES OF *SI QUIERES*. Montolío (1993:135) notes that *si quieres* may serve an S to correct a term he/she has used previously in the utterance. This use, however, is not motivated by any politeness principle, but it is a strategy to maintain the S's credibility.

The examples below will demonstrate another contextual meaning of *si quieres*, but here the usage of the marker specifically calls on the theory of politeness. Let us first consider a few utterances which recall Montolío's (1993) indirect request with the verb *importar* 'to matter', as in: *Si no te importa, acércame ese diccionario* 'If you don't mind, can you pass that dictionary for me?'

(3) Aw[5] Coja, *si quiere*, una silla de mi compañera.
'Take, *if you(P)*[6] *please*, a chair from my colleague'

(4) Am Siéntate un ratito. Déjalo aquí *si quieres*.
'Sit down for a while. Leave it here *if you please*'

(5) Aw Llévense los tres *si quieren*. Como pueden. Así lo miran y lo que les guste.
'Take(P) all three *if you(P) please*. Since you(P) can. This way you see it and whatever you(P) like'

Examples (3)–(5) clearly indicate the purpose of the use of *si quieres* in these utterances. It is evident that the agents do not need to employ this marker, constituted by an apparent *si*-clause and the verb *querer* 'to want', in order to convey the propositional content. In fact, *si quieres* mitigates the force of commands, which become offers due to the use of this marker. Thus, the occurrence of the *si*-construction with the desiderative verb *querer* 'to want' may serve to encode the S's polite attitude in offers, appealing to Lakoff's (1973) rules 'Don't impose' or 'Give options'.

Although the position of *si quieres* in our examples varies from Montolío's (1992, 1993) indirect request (expressed by a command preceded by a *si*-clause), we may also note that the corresponding markers of politeness in Catalan (*si us plau*) and in French (*s'il vous plaît*) serve a similar purpose. However, we cannot directly claim that *si quieres* is used in comparable contexts. On the contrary, our analysis will show that *si quieres* occurs only in two kinds of speech acts: in offers, as in (3)–(5), and in suggestions, as in example (6). Note that in suggestions S suggests **to do something** and in offers S suggests **to accept something** from him/her (S).

(6) Am O consúltaselo *si quieres*. Sobre todo que tendríamos que hacer la reserva sobre los que pidamos. Y luego nos contestan por si nos dan un día o dos días.
'Or consult it *if you please*. Especially that we would have to make a reservation for those we request. And then they reply whether they give us one day or two'.

In (6), an agent employs *si quieres* following an imperative which may consequently be interpreted as a suggestion; also due to the subsequent explanations given by the S. It is worth mentioning that an analysis comparing the intonation or, in general, prosodic features of sentences such as *Siéntate* 'Sit down' and *Siéntate si quieres* 'Sit down if you please' might show considerable differences. This is, however, beyond the scope of our study.

Offers and suggestions may also be expressed by declarative sentences, as illustrated by examples (7) and (8):

(7) Am De todas formas, yo te doy esto *si quieres*.
'Anyway, I'll give you this *if you please*'

(8) Aw Te echas un vistazo *si quieres*.
'Have a look at it *if you please*'

In (7), the agent makes an offer to his client. The S strategically employs *si quieres*, explicitly giving him (the client) the option not to accept what he (the agent) offers. According to Brown and Levinson (1987:173), this kind of strategy (*Be pessimistic*) serves Ss to redress 'negative face' in requests and/or offers. In (8), a suggestion, the use of *si quieres* appears to be similar to (7). Other examples of offers are presented in (9) through (11):

(9) Am Entonces, o bien, *si quieres*, nos quedamos con este hotel para la primera de julio y si no… no sé. Intentar lo que tú me digas.
'So, either, *if you please*, we hold on to this hotel for the first (week) of July and if not… I don't know. I'll try whatever you tell me'

(10) Aw …Ese sería uno. Luego, *si quieres*, uno un poco más al mar.
'…That would be one. Then, *if you please*, one a little more toward the sea'.

(11) Aw Te cuesta aproximadamente unas 51. [] Luego, hombre, ya depende ¿me entiendes? Y luego tienes, bueno, *si quieres* un poco más de cuatro.
'It costs you approximately 51. [] Then, well, it depends, you know. And then you have, well, *if you please*, a little more than four'.

In (9)–(11), the medial position of *si quieres* and the surrounding context indicate an existing problem which requires mitigation from the agents in order to satisfy their clients' wants. In (11), the occurrence of *¿me entiendes?* (cf. Chodorowska 1997) constitutes another signal of a problematic situation for the S. Similarly to *¿me entiendes?*, *si quieres* in (9) to (11) functions as a mitigating marker which conveys S's search for his/her interlocutor's cooperation. The S metaphorically steps out from the proposition (an offer) and metacommunicates his polite attitude towards the H, invoking Lakoff's rule 'Don't impose'.

The same marker occurs in suggestions, as in (12):

(12) Aw Mire. Para ir, *si quiere*, podría ir a las 9:50 pero en clase club. Es decir sería [] pesetas más. Y para volver, si quiere volver en clase turista tenía que ser el día 29, o sea la noche del 28 al 29 a las 5:40 o a las 7:45 de la mañana.
'Look(P). To go, *if you(P) please*, you could go at 9:50, but in the club class. It means it would be [] pesetas more. And to return, if you want to return in the tourist class it needs to be the 29th, that is the night from the 28th to the 29th at 5:40 or at 7:45 A.M.'

In (12), an agent suggests a possible flight to her client. The offered flight turns out to be more expensive than the one desired. The suggestion is attenuated by the marker *si quiere*, which is the non-canonical use of this construction. The difference between the canonical and non-canonical use of this construction is syntactic. The canonical use of the construction is followed by an infinitive (*si quiere* + V_{inf}), whereas the non-canonical is not. Interestingly, in the second part, the agent uses the *si*-construction in the canonical manner (*si quiere volver*), referring to the client's wish regarding the returning flight.

In summary, *si quieres* may be used as a conventionalized strategy to encode S's polite attitude in offers and suggestions. It is also an example of a discourse marker which metaphorically relates the S with the H in situations of mitigation.

3. PATTERNS OF THE USAGE OF *SI QUIERES*. Examples (1)–(12) reveal two clear patterns of the use of *si quieres* in offers and suggestions. Before we define them, let us consider the contexts of the occurrence of the marker (M). We may represent them in the following manner (1)'–(12)':

(1)' offer (OF)→M OF
(2)' suggestion (SG)→M→continuation (SG) SG
(3)' imperative statement (IS)→M→continuation (IS) OF
(4)' two imperative statements (IS) + (IS)→M OF
(5)' imperative statement (IS)→M→explanation (E) OF
(6)' imperative statement (IS)→M→explanation (E) SG
(7)' offer (OF)→M OF
(8)' suggestion (SG)→M SG
(9)' offer (OF)→M→continuation (OF) OF
(10)' tentative offer (OF)→M→continuation (OF) OF
(11)' explanation (E) + offer (OF)→M→continuation (OF) OF
(12)' suggestion (SG)→M→continuation (SG) + explanation (E) SG

Thus, *si quieres*, as a politeness marker, is only seen to occur in two patterns:

(i) ________ →(M) (final)
(ii) ________ →(M)→________ (medial)

In the first pattern, (i), *si quieres* in (1, 4, 7, 8) occurs at the end of the utterance. S may employ it after an imperative statement (4), offers (1, 7), and a suggestion (8). Comparing the imposition of these utterances to the remaining ones, it is clear that the illocutionary force of the sentence-final type is weaker.

In the second pattern, (ii), represented by (2, 3, 5, 6, 9, 10, 11, 12), *si quieres* occurs in the middle of utterances, sometimes even interrupting their flow (2, 3, 9, 10, 11, 12), in order to convey the S's attitude. Here, the marker, on the one hand, is preceded by imperative statements (3, 5, 6), offers (9, 10, 11) or a suggestion (2, 12), and on the other hand, is followed either by the interrupted speech act (3, 9, 10, 11, 12) or by an explanation (5, 6). As mentioned above, the illocutionary force of these utterances appears to be greater, as they help S to maintain a deferential attitude towards H and mitigate problematic situations.

In general, *si quieres* can be found in the function of interpersonal DM of mitigation in contexts of imperative statements (IS), suggestions (SG), and offers (OF).

4. GRAMMATICALIZATION OF POLITENESS THROUGH *SI QUIERES*. As mentioned before, the non-canonical use of *si quieres* in Spanish seems to lead to the process of grammaticalization of politeness in specific speech acts. In support of Traugott's (1995b, in press) accounts, we would like to suggest grammaticalization of the deverbal construction studied into interpersonal discourse marker of S's polite attitude towards H.

One argument in favour of grammaticalization may be the encoding of S's subjective attitude and thus an increase in pragmatic function (see Traugott 1995a). If we compare the use of this construction in its canonical and non-canonical (politeness) meaning, we can clearly note partial loss of the referential meaning of *si quieres* in place of the expression of S attitude in utterances whose force is attenuated.

The origin of the linguistic encoding of interpersonal distance through discourse markers rests on a context-induced process (metonymy) which, from the synchronic point of view, may seem to be a metaphor (Schwenter & Traugott 1995 and Traugott 1997). Also, Bybee et al. (1994:296) observe that 'metaphor is only possible in the very early stages' of grammaticalization. Although they do not consider metonymy to be a more appropriate manner of explaining change or extension in language, they argue that context is the most important factor among the mechanisms of change (op. cit. 297).

As is shown in this paper, the implicature of politeness, conveyed by *si quieres* may only arise in specific impositive contexts. Thus it is the metonymy which seems to have given rise to the process of grammaticalization of this construction as a marker of politeness.

5. CONCLUSION. In Section 2, we have shown, using examples taken from natural conversations, that *si quieres* can be used as a marker of mitigation of the assertive force of utterances. This marker invokes various politeness principles (Lakoff 1973; Brown & Levinson 1978; Leech 1983). It is a discourse marker, since it coordinates the 'ongoing talk' while metacommunicating S's feelings and attitudes. Its function can only be determined pragmatically in a given context in relation to the participants.

Bearing in mind these considerations, we have established two patterns of the use of *si quieres*: 1) sentence-final, and 2) sentence-medial. There were no examples of sentence-initial use of the marker. These patterns confirm that utterances which require 'softening' cannot be mitigated prior to production. A further argument for the non-occurrence of this marker in initial position may be that there is a partial retention of the meaning of their 'source constructions'. Thus, the marker may not be used as a discourse marker to encode politeness in the sentence-initial position, because its use could overlap with the referential meaning.

Overall, *si quieres* may be grammaticalized as a discourse marker to encode politeness only in the medial and final position.

The increasing number of studies of discourse markers points to the variety of different functions which these pragmatic expressions may serve in discourse. This paper has only considered one function *si quieres* may serve in conversations. Future accounts should study other possible functions of this construction.

The main contribution of this paper lies in the description of the deverbal construction *si quieres* which can be used as a polite marker in offers and suggestions. It also shows that, Ss in search of the expression of their attitude towards Hs, may conventionalize new linguistic devices.

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[1] I received many valuable comments on previous versions of this paper from Bernard Comrie and Carmen Silva-Corvalán.

[2] According to Fraser (1980), 'conversational mitigation' entails politeness.

[3] The endings of *querer* depend on the interlocutor/s to whom the S refers. *Si quieres* or *si queréis* addresses an H or Hs informally. *Si quiere* or *si quieren* addresses an H or Hs formally. While discussing the expression in general terms, we will refer to it as *si quieres*.

[4] Another term for speech-act conditionals (Van der Auwera 1986) or 'metalinguistic' conditionals (Dancygier 1990; Sweetser 1990), coined by Roulet et al. (1985).

[5] The following abbreviations are used in the data: A- agent, w- woman, m- man, and [ ]-irrelevant for the analysis.

[6] 'You(P)' marks more polite forms of addressing an H or Hs.

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* * *

REDUPLICATION IN COLLOQUIAL WESTERN ARMENIAN

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I have three purposes in choosing reduplication as a subject of presentation. One purpose is to expose a significant set of four reduplicative phenomena. A second is to extricate reduplication from the exclusive domain of phonology and the phonology-morphology interface. A third and final purpose is to demonstrate forcefully the direct connection between a lexical item on the one hand and on the other, discourse and pragmatics. The subject matter requires an intimate command of the language in question for purposes of both intuitive and analytical decisions; hence my choice of colloquial western Armenian (cwa), my native dialect.

1. The Problem. Reduplication has conventionally been considered to serve the purpose of intensifying the semantic and syntactic function of the base form, e.g., ‘very very good’ in English. The first set of five examples given below appears to demonstrate this intensifying function which could possibly incorporate the seemingly exotic pluralizing functions observed in various languages (Katamba 1993:180–97 and Jensen 1990:63–79).

(1)	a	*jiʃt*	‘correct’	*jipjiʃt*	‘absolutely correct’
	b	*ʃidag*	‘straight’	*ʃipʃidag*	‘absolutely straight’
	c	*canr*	‘heavy’	*capcanr*	‘extremely heavy’
	d	*garmir*	‘red’	*gapgarmir*	‘bright red’
	e	*sev*	‘black’	*sepsev*	‘very dark black’

The majority, if not all, of our available linguistic analyses of reduplication agonize over issues of phonological representation of the process in terms of autosegmental theory and its derivatives in template and prosodic—nonconcatenative—morphology. A good discussion of this is found in Spencer (1992:150–62) where Marantz, McCarthy, and others are liberally quoted.

I do not mean to trivialize these efforts or to suggest that they are unnecessary in every instance. Indeed they are indispensable within certain frameworks. A grammar of a language such as cwa would be incomplete without successfully processing appropriate phonological and morphological phenomena presented by reduplication within the lexicalist framework of generative theory (and more recent derivatives). In this study I am not primarily interested in those processes because I wish to dissociate the ‘reduplicated’ and ‘non-reduplicated’ versions. There are other far more interesting facets to ‘reduplication’. Evidence from CWA in this study may suggest that reduplication as a phenomenon is valid only diachronically. There is an interesting analogy here with grammaticalization. Once a form is grammaticalized, it is dissociated from its previous function. Consider the above data (1)a–e carefully.

Consider *garmir* (1)a. It refers to a continuum of shades of red. *gapgarmir* is specific. It refers to bright [blood] red. In other words, *garmir* and *gapgarmir* do not refer to the same color. Now consider *ʃıdag,* (1)b. The word means straight as in ‘a straight line’ and in ‘walk straight ahead’. It also means ‘real’ and ‘true’. *ʃıpʃıdag* has no reference to either ‘real’ or ‘true’. Its sole reference is to ‘a straight line/straight ahead’, in other words, without physical deviation. Similar arguments can be made for the remainder of the items in this category.

Examine the second set.

(2)	a	*gabel*	‘to tie’	*gabgəbel*	‘to tie up over and over’
	b	*saril*	‘to freeze/feel very cold’	*sarsəril*	‘to shiver, to have goose bumps’
	c	*maril*	‘to faint’	*marməril*	‘to act physically sensuous’
	d	*hərel*	‘to push’	*harhərel*	‘to push and shove’
	e			*xarxərel*	‘to make a complete mess of things’
	f	*çar*	‘naughty, evil’	*çarçarel*	‘to torture’
	g	*hod*	‘smell (noun)’	*hododel*	‘to sniff around’

Consider first the most blatant case, *maril*, (2)c, and its ‘reduplicated’ form *marməril*. There really is no semantic connection between the two. *xarxərel*, (2)e, takes the process to its logical conclusion. I am not aware of a ‘non-reduplicated’ form. There is a word, *xarnel* ‘to mix’ which might seem to challenge my previous statement. But the ‘reduplicated’ form is *xarnəxərun*, which means ‘too many things mixed in with each other’, ‘too much of a mix’, or ‘unrecognizable due to too many unrelated items mixed in with each other’. Here the word ‘too’ should suggest that *xarnəxərun* is not a desirable thing. Instead, *xarxərel* is related to an ‘unreduplicated’ base, *xalxul* ‘not sturdy’, or ‘something which could fall apart any moment’. The source of the former is probably Turkish and that of the latter is probably Arabic. Finally, consider *gabel*, (2)a, in the sense of tying a packet with a neat knot that can be easily untied. The ‘reduplicated’ form, *gabgəbel*, does not necessarily refer to tying anything. Rather it suggests tying up over and over again ropes, electric wires, garden hoses, yarn and so on in such a way that one either could not unravel them or have an extremely difficult time doing so.

2. Preliminary Generalizations. The evidence from the first two sets of data suggests that—for lack of better words—the 'non-reduplicated' and the 'reduplicated' forms are, on their own, in isolation, out of context, sufficiently distant semantically that they should not be considered derivatives of each other. Each would evoke a distinct 'scene' to use Fillmore's (1977) term. Each would require mutually exclusive syntactic frames. This much alone would in turn suggest that the two sets of forms are neither inflectionally nor derivationally related. The items from the two columns ('reduplicated' and 'non-reduplicated') should thus be listed as separate entries in the lexicon, in spite of the very strong association by virtue of phonological rules or formulas. A good illustration of this point of view is *çar*, (2)f, and its 'reduplicated' form. *çarçar-* has no meaning without a derivational suffix: *çarçarel* (a verb) or *çarçarank* (a noun) 'sheer torture/agony/struggle/pain' as in 'first year French is sheer torture', 'putting up with a four year old is a struggle', 'visiting relatives is a pain', and so on. Please note that I have used English phrases that induce empathy into the word 'torture' and its relatives. Real 'agony' in cwa would be *darabank*.

In spite of the above claims the respective items in the 'reduplicated' and the 'non-reduplicated' columns must be seen to belong to the same 'semantic sphere' just as the English verbs 'want', 'desire', and 'crave' belong to the same 'semantic sphere'. These English verbs, however, are not phonologically related. Hence there is no temptation to submit them to autosegmental analyses. The English verbs in question are not analytically reminiscent of, for example, the infamous Arabic *kitaab* 'book', *kutub* 'books', *kaatib* 'author', *kuttaab* 'authors', and so on.

3. Discourse and Pragmatic Connections. The next two data sets move the issue of 'reduplication' further away from the phonological and lexicalist domains. They demonstrate a specially strong interaction with discourse context and extra-linguistic, pragmatic, information. Consider the items in the third set of data.

(3)	a.	*hivant*	'sick'	*hivantmivant*	
	b.	*ator*	'chair'	*atormator*	
	c.	*dedrag*	'note pad'	*dedragmedrag*	
	d.	*dun*	'house'	*dunmun*	
	e.	*hod*	'smell'	*hodmod*	(see (2)g)
	f.	*madid*	'pencil'	*madidmudid*	
	g.	*mart*	'person, man'	*martmurt*	'a mass of humanity'*
		*(in a negative context it would mean 'not a soul' as in 'there was not a soul in class')			
	h.	*jart*	'bright, gaudy'	*jartjurt*	'very exaggerated talk'
	i.	*maril*	'to faint'	*marilmuril*	(see (2)c)

Concerning (3)a–i: In these cases the 'reduplicated' forms reflect cynicism and a fatigue with the subject matter. For example, if you have spent all day looking for a house to buy or rent unsuccessfully, you might say one of the following at the end of the day: 'I don't ever want to look at another house' or, 'don't mention the word house to me…' roughly translated as:

dunimuni	*masin*	*çem*	*uzer*	*imanal*
house	about	I don't	want	to hear

Fatigue with a subject matter in English is periphrastically expressed, often through extended discourse, and with gestures and contorted facial expressions. The same is true in CWA. One can't just say *dunmun,* (3)d, and expect the hearer to grasp the entire communicative intent. Consider specifically *dedrag,* (3)c, an innocuous item in contrast to *dedragmedrag*. One cannot substitute the latter for the former and expect to be understood to be saying 'I am tired of note pads'. In fact *dedragmedrag* is used in a rather marked context. One needs to have had a frustrating time with a variety of things and events. The subject of a note pad happens to enter the picture at the end of the time frame in question, and it may or may not be a cause for further frustration. One might well utter the following either out of frustration for the preceding time frame or in anticipation of additional frustration:

dedragmedrag	*mi*	*holover*	*inci*	=	don't lecture (to) me [on] note pads
	don't	lecture	to me		

dedragimedragi	*masin*	*çem*	*uzer*	*imanal*	=	I don't want to hear about
	about	I don't	want	to hear		note pads

In *jart* and *jartjurt*, (3)h, the 'non-reduplicated' form refers to [-animate] objects, especially cloth and clothing. The 'reduplicated' form refers to speech acts. The points of reference are perhaps the furthest apart here.

Consider now the fourth and final set of data (ć represents the affricate t̲s̲):

(4)	a	*ʃəpot*	'a confused person' (usually older)	*ʃəpotməpot*	'about the same meaning but with added cynicism'
	b	*ʃəpaćac*	'a spoiled person' (usually younger)	*ʃəpaćacməpaćac*	'about the same meaning but with added disgust'
	c	*maril* (see (2)c)	'to faint'	*marilməril*	'about the same meaning but with added disbelief'
	d	*hərel* (see (2)d)	'to push'	*hərelmərel*	'to push and shove but with hesitation to participate in the act'

The role of pragmatics and discourse are perhaps most poignant here. Consider (4)b, *ʃəpaćac* and *ʃəpaćacməpaćac*. There is here a hint of illocutionary force added by the speaker to communicate 'disgust' in this case, 'cynicism' in (4)a, 'disbelief' in (4)c, and 'hesitation' or 'unwillingness to participate in the act' in (4)d. This last one (4)d is probably the most exotic of the set. It evokes a mob scene such as at a flea market, a spring arts festival, or outside a football stadium at the end of the game, through which the speaker does not want to go. Here is an utterance in CWA that perfectly elicits *hərelmərel*. Moreover, the speaker needs this discourse frame as well as a larger discourse that provides for pragmatic inferences and information to justify the use of the 'reduplicated' form. In other words, to provide for a natural and appropriate context for *hərelmərel*:

> *aman aman çe çe çe çe gə xəntrem mi danik inci, martmurt, hərelmərel, çem sirer adank paner* =
> [The strongest possible way of saying] 'No, no, no, no I beg you, don't take me with you. I hate that mob scene, the pushing and shoving. I hate that sort of thing' [implicit here is also a dislike for sweat and/or the inevitable bodily contact and so on].

4. Further Considerations. Once again the requisites of the 'non-reduplicated' forms and those of the 'reduplicated' ones are quite distinct. Again the respective items from each of the columns in this set are entered as separate lexical entries. No mechanism, or process, has been proposed to transform, for example, *ator*, (3)b, to *atormator*, independent of syntax, discourse, and pragmatics. In other words, there is no motivating mechanism that can derive *atormator* from *ator* inside an autonomous lexicon. Nor would embedding *hərel* ((2)d, (4)d) in a very complex frame such as the one above on mob scenes with the discourse and pragmatic information necessary to trigger 'reduplication' as a matter of inflection or a post-lexical rule.

The various processes associated with Level Ordering Morphology (LOM) could not account for the 'reduplicated' forms in the CWA data and would in any case be counterintuitive. LOM entails an ordered sequence of derivational affixation followed at each level; in other words, after each affixation, by appropriate phonological rules, and then possibly further affixation, and so on, until the word is not further derivable. Consider the following English examples:

Proportion	nation	comfort
Proportion-al	nation-al	comfort-able
Proportion-al-ity	nation-al-ity	comfort-able-ly

Phonological rules would intervene at each level to move stress and/or apply the necessary phonological changes. Nevertheless the underlying semantic common denominators in the English examples are far too transparent. Sentence syntax would reject the wrong choice on categorical grounds in the first instance. In contrast, the CWA examples—with the exceptions of *hod*, (2)g, and *çar*, (2)f—do not exhibit changes in grammatical category, and their semantic distance is far too great. *çar* was discussed above. The other exception, *hod*, has unique grammatical properties. Whereas *hod* is a noun and its 'reduplicated' form *hododel* is a verb, *hododel* means 'to sniff around' as a dog would. The verb is never used with reference to a human unless one wished to use it metaphorically and wished to be insulting. The verbal counterpart of *hod* is a compound, *hod arnel* 'to take [a] sniff'.

5. GENERALIZATIONS. The strongest implication of my proposal here is that 'reduplication' as a term or a process is anomalous, even invalid, at least for CWA. The following inferences ensue from this:

1. Reduplication is underestimated. It reflects a more complex phenomenon than is recognized in the current literature.

2. Words such as *maril*, *marməril* ((2)c), *marilmuril* ((3)i), *marilməril* (4(c)), and the like need to be entered as separate lexical items. There needs to be a model that connects the lexicon and domains of language beyond sentence syntax. In short, discourse and pragmatic information must be related to individual lexical entries.

3. Phonological rules are immaterial and inconsequential in CWA. The intended thrust of this point is that if the 'reduplicated' forms were to be included in the lexicon independently of the 'non-reduplicated' forms as separate lexical items, phonology would not play a role. This perspective may have validity beyond CWA.

4. There needs to be a mechanism to either allow or block the use of certain of these words in the appropriate or inappropriate language register.

6. PROBLEMATICAL AREAS. There are at least two problematical areas not addressed above:

(a) The presence of *maril* ((2)c, (3)i, and (4)c), *hərel* ((2)d.1 and (4)d), and *hod* ((2)g and (3)e). But this could legitimately be ignored within the framework proposed above.

(b) The second problem is more difficult to dismiss. (3)a–f can be uttered as:

hivantimivanti
atorimatori

dedragimedragi
dunimuni
hodimodi
madidimudidi

The / i / signals case in CWA. If it were appended consistently only at the end of the 'reduplicated' form, e.g., **hodmodi*, it would support the general conclusion reached above. The fact that it *can* be inserted at the end of both forms, *hod+i-mod+i*, may suggest that the native speaker's intuition continues to recognize an actual process of reduplication.

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THE FORMS AND FUNCTIONS OF THE PASSIVE IN KOREAN

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The passive construction has been widely examined from morphosyntactic perspectives within individual languages and in crosslinguistic studies. The functions of passives in discourse, however, have received less attention although there are some studies in that direction (e.g., Thompson 1987, Givón 1994a, b). The purpose of this paper is to study both the forms and functions of Korean passives in written texts.[1]

In his typological study, Keenan (1985:247) describes the basic passive as one with no agent phrase, like *John was slapped*, and whose main verb in its non-passive form is transitive and expresses an activity with an agent subject and patient object. Other studies (Comrie 1988, Haspelmath 1990) have attempted to establish a prototypical definition of the passive as one with a defocused agent. Shibatani's (1985:837) 'characterization of the passive prototype' has correlates from pragmatics and semantics to syntax and morphology. The primary pragmatic function, he claims, is agent defocusing (see also Myhill 1997).

Givón (1994a:4) argues for a definition in functional, not structural, terms: 'A cross-linguistic grammatical typology is nonsensical unless it is based on an independent functional definition'. He proposes to study the voice system of a language as a whole to see the functional distribution among different possibilities there are in that language, e.g., passive, antipassive, inverse, etc. As the functional domains of passive voice, he presents agent demotion, nonagent promotion, and stativization (Givón 1990:567–72).

This study adopts a slightly adjusted definition of the passive from Comrie (1988:21): 'a construction where the P is clearly subject, where the A is at most minimally integrated into the syntax of its clause,' and in which the verb involves a morphosyntactic modification. The last, adjusted part seems clearer than his statement 'a construction which is marked in terms of voice'. The functional part of the definition is similar to what Givón proposes, except for the stativization domain, as will be shown (Sec. 3).

Korean passives boast a sizable body of literature, most of which focus on three morphosyntactic and semantic aspects: (1) causative-passive correlation in the same morphological forms (Park 1988, Yeon 1991), (2) semantic difference between short and long forms (Kim 1989, Lee 1993), and (3) adversity (Kim 1994, Park 1995). From a pragmatic, functional view, Kwak (1994) presents a statistical distribution among active (or direct), passive, inverse (marked only by OSV inverse word order), antipassive (the O/Patient is not expressed), and impersonal subject clause (with just OV). Notice, however, only the passive has a modification in the verb; the other voices are concerned with either word order or the presence or absence of an argument on the surface. Thus the passive is the most clearly marked voice in Korean and deserves a study of its own.[2]

Section 1 of this paper argues that Korean has three types of passive, not just two as discussed in previous studies. It points out a motivation or possible diachronic origin for each type from the crosslinguistic perspective. Their discourse and pragmatic functions are discussed and illustrated with data from natural texts in Sec. 2, in a qualitative approach to complement the statistical study of Kwak (1994). I propose that the primary function of passives is to maintain the topic continuity across clauses and sentences. To avoid mentioning an agent who is either obvious in context or irrelevant cannot be the only motivation for the use of passives in Korean, since no overt subject (or any other argument) is necessary when it is understood from context. That is, one may use an active sentence and still avoid mentioning the agent (Hwang 1994). In contrast to Givón's claim for the 'stativization' function, I propose in Sec. 3 that the primary meaning of the passive verb is to mark it as a process, that of 'becoming,' although some verbs in context are interpreted to be a state, that of 'being'.

1. MORPHOSYNTACTIC FORMS OF PASSIVES. Passives in Korean are classified into three types according to the morphosyntactic modifications of transitive verbs: the morphological type with *-hi* (and its variants, *-i*, *-li*, *-ki*), the analytic or periphrastic type with *-e.ci* (a combination of the ending *-e* to the verb and the auxiliary verb *ci* 'become'), and the lexical type with *-toy* 'become', *-pat* 'receive', or *-tangha* 'get'. In all three types, passives are marked by some change in the verbal form, and are distinguished from left-dislocations or inverse constructions that may have only a change in word order.

The first two types have variously been referred to as short vs. long, or morphological vs. phrasal or periphrastic forms. The first type uses an additional stem suffix and, although more frequent in textual data, is more restricted in distribution; it may not occur with all transitive verbs.[3] The second type, which is more productive, consists of an adverbial ending *-e* (attached to the lexical verb) and the auxiliary verb *ci* 'set' (like 'the sun sets'), or 'become'. It is consistent with Haspelmath's (1990:38) derivation of 'passives from inactive auxiliaries' (such as 'be', 'become', 'stay') in many languages.

The third type, *-toy* 'become', *-pat* 'receive', or *-tangha* 'get', replaces the *-ha* 'do' verbal ending that follows such nouns as *palcen* 'development', *chingchan* 'praise', *palkyen* 'discovery', and *kwusok* 'arrest'. Most of these nominals are of the Sino-Korean type. The nominal form remains constant and the verbalizing suffix alternates between the active ending *-ha* and passive endings like *-toy*. Thus this type uses an 'alternate stem affix' (Haspelmath 1990:31), rather than a suppletive root like the English lexical causative *kill* (vs. *die*). The pattern of alternation, however, indicates that it is the lexical type.[4] This type is more varied in form and has not been widely recognized as passive, but it should be, since it clearly lowers the valence of the active clause with concomitant changes in the A and P nouns.

In all three types the formal markers of passive can also be used for other purposes like the causative and inchoative. Such multiple use of a passive form is not uncommon crosslinguistically, and different uses of the same form may provide valuable clues to the diachronic sources and evolution of passive markers, as shown by Haspelmath (1990).

Type 1: -*hi* and its variants probably derive from causative suffixes through causative-reflexive.[5] This derivation or overlap in form is similar to *get* in English which is used as causative or passive (Keenan 1985:263):

(1)	*John got Bill fired*	(Causative)
	John got himself fired	(Causative-reflexive)
	John got fired	(Passive)
	The window got broken	(Passive)

(2)	*ku-ka*	*swunkyeng-eykey*	***cap-hi**-ess-ta*
	he-Nom	policeman-Dat	catch-Pass1-Past-Decl

‘He got (himself) caught by the policeman’. (Causative-reflexive)
‘He was caught by the policeman’. (Passive)

Type 2: When combined with stative verbs, -*e.ci* (or -*a.ci* by vowel harmony) marks inchoative (change of condition), deriving a process verb, but it marks passive when combined with transitive:

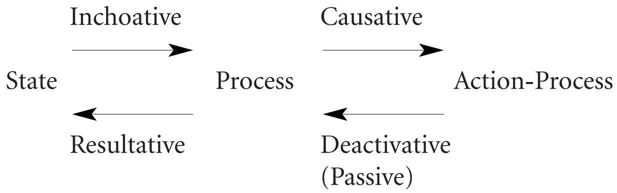
(3)	*palk-a.ci*	‘be.bright’	→	‘become bright’	(Inchoative)
	nelp-e.ci	‘be.wide’	→	‘become wide’	(Inchoative)
	kkay-e.ci	‘break’	→	‘is/become broken’	(Passive)

Type 3: *toy*, *pat*, and *tangha* may be used as main verbs to mean ‘become’, ‘receive’, and ‘get’. The most common form *toy* marks inchoative (with -*key*) when combined with stative verbs:

(4)	*al-key.toy*	‘know’	→	‘come to know’	(Inchoative)
	hayngpok.ha-key.toy	‘be.happy’	→	‘become happy’	(Inchoative)
	palcen-toy	‘development’	→	‘is developed’	(Passive)

Derivational processes might be shown across the types of verbs from states to processes and action-processes (Chafe 1970:132; Hwang 1975:53).[6]

(5)



For example, a state or condition, *the blanket was dry*, turns into a process ('what is happening') with inchoative, *the blanket dried*, which in turn can be causativized to *I dried the blanket* (an action-process: 'what an agent is doing' and 'what is happening to another noun'). In a derivation of the opposite direction action-process verbs are deactivated, a process which I consider to be analogous to passivization. *I made it wet* (an action-process) is deactivated to *it got wet* (a process), which can be turned into *it was (in the state of being) wet* with a resultative or stative sense.

In Korean the same morphological form (Type 1) is used for causative or passive: causative to derive an action-process verb *cwuk-i* (causative) 'kill' from a process verb *cwuk* 'die', or passive in the opposite direction, *yel-li* (passive) 'is opened' from *yel* 'to open'. The analytic form *-e.ci* (Type 2) or the verb *toy* (Type 3) derive a process verb, either as an inchoative from a state (*nelp-e.ci* 'become wide' from *nelp* 'be.wide'), or a passive from an action-process verb (*kkay-e.ci* 'be(come). broken' from *kkay* 'break'). The passive verb *kkay-e.ci* denotes a process, which is close in meaning to English 'It broke'. For the explicit sense of state or condition, the resultative or stative marker *-e.iss* is added after the passive: *kkay-e.ci-e.iss* 'is (in the state of being) broken'.

The choice among the three types may be dependent on the verb. A Sino-Korean word with a *-ha* ending would take Type 3, and not all transitive verbs may passivize with Type 1. Type 2 is the most versatile, with the widest application. But the distribution of the three types in three sources of texts[7] shows that Type 1 is the most frequent, and that around 20% of the passives in texts are agented, which is similar to written English (Thompson 1987 and others).

(6)

	Type 1	Type 2	Type 3	Total
Little Prince	46 (74%)	14 (23%)	2 (3%)	62 (100%)
8 short stories	25 (81%)	2 (6%)	4 (13%)	31 (100%)
Dreaming Incubator	42 (58%)	13 (18%)	18 (24%)	73 (100%)
Total	113 (68%)	29 (17%)	24 (15%)	166 (100%)
Agented	25	4	6	35 (21%)

One remarkable sentence from the story *A Dreaming Incubator* contains passives of all three types:

(7)	*tewukte*	*ettekhamyen*	*pissa-key*	***phal-li**-na*	*ha-nun*
	more	how	expensive-Adv	sell-Pass1-Q	do-Modif[8]

	ccok-ulo	***killu-e.ci**-ko*	***kyoywuk-toy**-l*	*thenikka-yo.*
	way-toward	raise-Pass2-and	educate-Pass3-Modif	because-Decl

'It is because (they) will **be raised** and **educated** in such a way that (they) will **be sold** more expensively'.

As for agent phrases in a passive clause, several markers are used. The two basic markers are *-ey* (locative) for the inanimate and *-eykey* (dative, or the colloquial variety *-hanthey*) for the animate. This pattern of split based on animacy is true in all cases, including their more common use for marking the locative and goal.[9] *-eykey* may mark a source which is also an agent:

(8)	Goal:	'I sent flowers **to** Mary'	(Mary-*eykey*)
	Agent:	'She was captured **by** a tiger'	(tiger-*eykey*)
	Source/agent:	'I learned French **from** Mary'	(Mary-*eykey*)

A grammaticalized marker *-ey.uyhay* 'by' (from the verb *uyha* 'is due to') corresponds very closely to the idea of agency (see (9) below), but may be awkward or sound like a translation in certain usage.

A clause may not have two nouns marked by *-eykey*, one for goal and the other for agent, probably due to a possible confusion. When there are two agent phrases, one tends to be marked by *-ey.uyhay*, which is sufficiently different from other forms. It is unnatural to have both marked with *-ey.uyhay*.

(9)	*ku*	*hokseng-un…*	*chenmunhakca-**ey.uyhay***	*mangwenkyeng-**ey***
	the	star-Top	astronomer-by	telescope-Loc

	*cap-**hi**-n*	*cek-i*	*issetta.*
	catch-Pass1-Modif	occasion-Nom	was

'The star has once been caught in/by a telescope by an astronomer'.

Three other forms for agency are found in texts: *-eyse* (source or locative), in *cwuwi-**eyse*** 'surrounding-from' ('Families with only daughters are sympathized with by those around them'), *-lo* (instrument), in *manto-**lo*** 'mantle-with' ('The star was all covered with/by a mantle'), and *-ul.thonghay* (path), in *hwuson-**ul.thonghay*** 'descendant-through' ('Our lives are continued through/by our descendants').

Semantically, passive sentences may not be only from prototypical transitive clauses with agent and patient. Many involve not an agent but an experiencer: *po-i-ta* 'is seen'; *tul-li-ta* 'is heard'. Some happenings may be spontaneous, with no agent: *tongacwul-i kkun-e.ci-etta* 'The rope broke/cut (by itself)'.[10]

No single morphosyntactic criterion marks passive unambiguously; that is, form alone is not sufficient to identify the passive in Korean. A combination of structural features along with semantic and pragmatic criteria indicates the passive.

2. FUNCTIONS OF PASSIVES IN DISCOURSE. In her discourse study of English passives, Thompson (1987:497) presents the strategy for choosing a passive over an active, given a two-participant situation in which one of the participants is an agent: 'If the agent is not to be mentioned, use the passive. If the agent is to be mentioned, then use the passive only when the non-agent is more closely related than the agent either to the 'theme' of the 'paragraph,' or to a participant in the immediately preceding clause'. This strategy regarding the agented passive is largely followed in Korean as well.

To see the discourse context of passives in Korean, a portion of text from *The Story of Shim Chung* is shown below (in English only, except for the three passive sentences; the agents are underlined, and the passive subjects, along with previous references to them, and the passive verbs are in boldface):

(10) s63 One day a neighbor, Kwiduck's mother, came and said that **seamen** (*payt salam-tul-i* 'sea person-Pl-Nom') were looking for a girl to buy.

s64 'What do (they) say (they) will use the girl for after (they) buy (her)?'

s65–68 '(They) will have a sacrificial rite to the King of the Sea and put (her) into the sea…' (Direct speech by Kwiduck's mother)

s69 Upon hearing this, Shim Chung thought that these were the people God sent for her, so (she) begged Kwiduck's mother and came to meet the **seamen** (*payt sakong-ul* 'seamen-Acc').

s70 'Please give 300 bags of rice for my father and take me'.

s71 Thus Shim Chung told (them) her decision.

s72	**payt salam-tul-un**	*sim chengi-uy*	*hyosim-ey*
	ship person-Pl-Top	Shim Chung-Gen	filial.piety-Loc
	***kamtong-toy**-se-n*	*han.epsi*	*sim chengi-lul*
	move-Pass3-so-Top	without.limit	Shim Chung-Acc
	chingchan.ha-ko…		
	praise-and		

(10) 'The **seamen** ***were*** deeply ***moved*** by the filial piety of Shim Chung, praised Shim Chung a lot, and (in addition to 300 bags of rice, even gave enough fortune for Shim Bongsa to eat, wear, and spend for life)'.

s73–74 Neighbors praised her; she just told her father she would leave for a faraway place…

s79 & 80 the seamen (*payt salam-tul*)…

s83 (New episode)
elma *hwu-ey* *nelp-un* *pata* *wi-ey-nun* **han songi**
a.while after-Loc wide-Modif sea on-Loc-Top one Counter
yeyppu-n **yen.kkoch-i** *phiena* *seycha-n* *mulkyel-ey*
pretty-Modif lotus.flower-Nom bloom strong-Modif wave-Loc
mil-ly*-e* *enu* *nasse-n* *pata.kka-ey* *taassupnita.*
push-Pass1-and certain strange-Modif seashore-Loc arrived

'After a while, **a pretty lotus flower** bloomed in the middle of the sea and arrived at a certain shore ***being pushed*** by the strong waves'.

s84 Then out of the flower Shim Chung, who had jumped into the sea, appeared unexpectedly.

s85 **sim chengi-nun**… *somun-i* *na-se*
Shim Chung-Top rumor-Nom occur-so
nacwung-ey-nun *wangpi-lo* ***ppop-hi****-key.toyessupnita.*
later-Loc-Top queen-as choose-Pass1-became

'**Shim Chung** became known (as a beautiful girl sent by the King of the Sea), and later ***was chosen*** as queen'.

Let us compare features of the noun phrases used as passive subjects and agents in the three passive clauses. The subject in s72, 'seamen', is introduced in s63 and is the topic of the episode. The agent is Shim Chung's devotion to her father (filial piety), which is abstract, inanimate, and indefinite. Although it is the abstract theme of discourse, it is never mentioned as *hyosim* 'devoting mind' elsewhere in the story. It is more commonly referred to as *hyosung* 'devotion'.

In s83, 'a lotus flower', which is introduced in the first clause, continues to be the subject by zero anaphora in the following passive clause. The agent, 'strong waves', is new information which has no further reference (i.e., high value in referential distance (RD) and zero in topic persistence (TP), per Givón 1983, 1994b).

The passive subject in s85, Shim Chung, is the central participant of the story with the highest level of topicality, i.e., the most continuous topic, while the unexpressed agent is either irrelevant or is the typical agent involved in choosing a queen. It could be the king, but he is inactive in the plot structure and is mentioned only once as an addressee in the final episode.

Thus, the passive subjects in all three examples display high topicality (locally or globally), and they are also concrete and definite. The agents, on the other hand, are indefinite and inanimate in the two passive clauses with expressed agents.

The quantitative comparison of RD and TP in Kwak's study also shows that agents in passives are high in RD (the value of >3) in 93% of the cases (as opposed to 51% for actives), i.e., more distant and not topical in previous text, and low in TP (the value of 0-2) in 86% (cf. 35% in actives), i.e., not persisting in upcoming text. Patient nouns that are promoted to the subject are more topical than agents in both anaphoric and cataphoric contexts. Thus, the noun that is more topical is chosen to be the subject. In most cases the continuing topic is the agent and the clause is active (75% in Kwak's study), but in marked cases (10%) the patient is higher in topicality and in order to keep the same topic across clauses and sentences, a marked voice—the passive—is used.

An example occurs in another story in which this topic continuity strategy seems to be broken. There are, however, other competing forces at work.

(11) s5–13 (Dialogue exchanges between Tiger and Grandma)

s14 But Tiger appeared again, and snatched up (*ppayat*) and ate up all the cake that (she) was taking to the children.

s15

halmem-un	*[holangi-hanthey*	*ttek-ul*	*motu*	***ppayat-ki**-ko]*
grandma-Top	tiger-Dat	cake-Acc	all	snatch-Pass1-and

pin	*son-ulo*	*tolakakoissessupnita*
empty	hand-with	was.going.back

'**Grandma** had *been robbed* of all the cake by Tiger and was going back (home) empty-handed'.

Tiger and Grandma are equal in topicality ranking in this episode, but only Tiger is mentioned in the previous sentence (s14) although there is an implicit reference to Grandma in the relative clause. Why is the first clause in s15 in passive? There are two motivations for this: (1) s15 is now stated from Grandma's point of view, as seen clearly from the final, main clause; and (2) the passive clause cohesively backreferences the event in the previous sentence, paraphrasing it from Grandma's perspective.

Another example comes from the story of *The Hat Seller*, where the hats, rather than the continuing agent-topic, the hat seller, is the subject of the passive:

(12)

s8 After sleeping for a while **the hat seller**… was very surprised to see not many **hats** in the box.

s9 (He) did not know what happened, so (he) looked for (them) all around.

s10	*kulena*	**moca-nun**	hana-to	***po-i**-ci.an-ass-upnita*
	but	hat-Top	one-even	see-Pass1-Neg-Past-Decl

‘But not a single **hat *was seen***/visible’.

s11 The **hat seller** did not know what to do, so…

In s10 the hat seller, although unencoded, is the experiencer, as ‘not a single hat was seen (to/by him)’. As the continuing topic, the hat seller is not overtly referred to in S9, i.e., zero anaphora, a form for the most continuous and accessible topic (Givón 1983). I argue that it is the same case in s10: the hat seller is assumed to be the experiencer or viewer, and since he is known to the reader, no reference to him is needed. With its temporary focus on the hats and the zero anaphora of the hat seller, the passive is more natural in Korean than the active clause for ‘But he could not see a single hat’.

To compare the uses of passives in English and Korean in roughly the same text, the passives in *The Little Prince* were studied. The two language texts are similar in their distribution of about 80% of the passives without an agent, although English used more tokens (91) of passives overall.

(13)

	Agentless	**Agented**	**Total passives**
English	74 (81%)	17 (19%)	91 (100%)
Korean	48 (78%)	14 (22%)	62 (100%)

There are some adjectival uses in English that are similar in form to passives, but are excluded from our counts: *was concerned with*, *pleased*, *isolated*, *interested*, *obliged to*, *tired*, *ashamed*. A total of 17 agent phrases occur that are either inanimate (9), *by the failure*, *this half confidence*, *sobbing*, *an attack of rheumatism*, *a little puff of wind*, or human but indefinite (8), *by a king*, *an old gentleman*, *anyone*, *experts*, *all the others*, *a lazy man*. These examples clearly show the tendency for definite human agents not to occur as passive agents.

In the Korean translation, passives of perception verbs (*po* 'see', *tut* 'hear') are most frequent. They may correspond to English passive ('is seen') or active intransitive ('is visible' or 'look').

(14) **kacang** **cwungyo.han-ke-n** *nwun-ey* ***po-i***-*ci.an-nunta*
most important-thing-Top eye-Loc see-Pass1-Neg-Decl
'What is most essential is invisible to the eye (or is not seen)'.

(15) *ssulssul.ha-y* ***po-i***-*nta*
be.lonesome-Adv see-Pass1-Decl
'(She) looks lonely'.

Some English passives, e.g., *is inhabited* and *is born*, are typically expressed in Korean as actives: *sal* 'live', *thayena* 'to birth, is born'.

3. PROCESS MEANING. I have tried to show that Korean has three types of passive, including the lexical type, in contrast to the studies which mention only two types—short and long. The form of each type reflects a crosslinguistically attested motivation, which may provide clues to diachronic sources in a future study of historical development in Korean. The morphological type is very likely to have been derived from causatives, and synchronically the same forms are used for both. The analytic and lexical types resemble the inchoative form, which derives a process from a state. Again both functions (passive and inchoative) are used synchronically.

The motivation for causative-passive overlap can be seen through causative reflexive, as shown in example (1). But the motivation for inchoative-passive overlap is unclear. I propose that the passive primarily denotes a process, not a state, and that this semantic overlap with process is what ties together inchoative and passive. Relative to the active, in which the event is 'framed as a bounded, fast-changing, agent-initiated *process*' (Givón 1990:571), it is certainly close to stativization, 'a *resulting state*'. But the passive often indicates a process between a state and an action-process (see diagram in (5) above). The 'process' meaning is left in passives after 'action' is taken out from 'action-process'. Look at the set of English sentences with open:[11]

(16) a. He opened the door. (Action-Process)
b. The door opened. (Process)
c. The door was opened. (Process)
d. The door was open. (State)

Is the passive in (16)c a state like (16)d or a process like (16)b? It seems closer to (16)b as a process, although there is a possible implied agent in (16)c, which will in fact make the passive higher than (16)b in transitivity (Hopper & Thompson 1980).

While in English we might say that there are two process types, as shown in (16)b and (16)c, in Korean they are neutralized into one form, the passive.

When the state sense needs to be explicit, the resultative form *-e.iss* is added after the passive: *yel-ly-e.iss-ess-ta* (open-Pass-Result-Past-Decl) 'was open'; *kel-ly-e.iss-ess-ta* (put-Pass-Result-Past-Decl) 'was stuck'. In our Korean data corpus, there are a number of examples that have a sequence of these two markers, the passive and resultative, to express 'was (in the state of being) hidden, covered, spread, prepared, drawn'. In Korean, as in the case of many English passives, a simple passive form may also imply a state (e.g., *The rope was cut*). When looking for a door that is open, one can say *i ccok mun-i yel-ly-ess-e* (this side door-Nom open-Pass-Past-Decl) 'The door on this side is open'. It is interesting to note that the sentence has the past tense suffix to denote the present condition; it is like saying 'the door was opened and is now open'. One can be explicit with resultative (with no past tense): *yel-ly-e.iss-e* 'is open'.

Beyond morphosyntactic evidence in form, e.g., having two markers for the explicit meaning of 'state,' there is further evidence from discourse. Most clauses with passives report eventline information in narrative (cf. Hwang 1987:93-95). The three passive sentences from *The Story of Shim Chung* in (10) indicate happenings (the seamen were/got impressed, the lotus flower was pushed to the shore, and Shim Chung was chosen as queen). The passives followed by the resultative suffix are, of course, marking nonevent and state. The *get*-passive in English (cf. example (1); Givón & Yang 1994) seems to denote the process meaning more clearly than the *be*-passive, probably due to the semantic difference between the verbs *get* and *be*.

In conclusion, this study shows that Korean has three types of passive morphosyntactically, and they primarily function to maintain topic continuity. Thus, as in English, although less frequent, they are used when the patient is more topical than the agent. I further propose that passives, especially in Korean, denote a process meaning that focuses on the change of condition or happening. Depending on the kinds of verb and context, they may denote a state as well. Thus, out of context it is often ambiguous whether a passive sentence expresses a state or process.

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[1] I am grateful to Connie Eble, Marlin Leaders, Sandy Thompson, and Chuck Walton for their helpful comments on the paper.

[2] One characteristic of Korean passives is that the indirect (recipient) object may not be promoted to the subject (**nay-ka chayk-ul cwu-e.ci-ess-ta* (I-Nom book-Acc give-Pass2-Past-Decl) 'I was given a book'). The patient object will change its case to nominative in such a sentence and become the subject of the passive. However, the patient object may retain the accusative case when it is in part-whole relation to the promoted subject, as in *na-nun Mary-eykey pal-ul palp-hi-ess-ta* (I-Top Mary-by foot-Acc step.on-Pass1-Past-Decl) '(I) had my foot stepped on by Mary' (Kim 1994).

[3] Yeon (1991:345) lists verb classes that cannot be morphologically passivized or causativized in Korean: e.g., *ha* 'do' verbs, ditransitive verbs ('give', 'receive'), benefactive verbs ('help', 'buy'), experiential verbs ('learn', 'hope'), etc.

[4] Depending on the semantic nature of the verb, there might be degrees of adversative connotation (Park 1995): e.g., *kwusok-tanghaytta* ('he got arrested') with *tangha* 'get' is more adversative than the neutral reporting found in *kwusok-toytta* ('he was arrested') with *toy* 'become'.

[5] The verb *mek* 'eat' is an exception: *mek-i-ta* 'cause to eat, feed' vs. *mek-hi-ta* 'is eaten'.

[6] There are other cases not shown here: action verbs and caused action verbs, as in *mek* 'eat' and *mek-i* 'feed' where the causative implies the presence of a causer in addition to an agent.

[7] They are: Korean translation of *The little prince*, eight short stories analyzed in Hwang (1987), and a story called *Kkwum kkwunun inkhyupeyithe* 'A dreaming incubator' by Wan-suh Park.

[8] Modif stands for Modifying ending, as used in a verb in relative or complement clauses.

[9] A similar split in animacy is found in Yidiny in which the demoted P (object in original transitive) takes either dative or locative case in the antipassive construction (Comrie 1989:189). Also notice that *by* in English is a locative marker as well.

[10] Lee (1993:285) claims that Type 1 denotes 'spontaneous and accidental processes whereas the auxiliary passive denotes processes which are carried out intentionally.' While many of his examples are quite persuasive, other types also may denote spontaneous processes with some verbs, as in *kkun-ki-ta* and *kkun-e.ci-ta* 'is cut'.

[11] This is a good example since the word *open* may function as an adjective as well as a verb, unlike a verb like *break* or *close*, which is ambiguous between a process and state meaning in passive: *The vase was broken* or *The door was closed*.

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IS JAPANESE *GA* A ‘SUBJECT MARKER’?: EVIDENCE FROM CONVERSATION

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The Japanese nominal postposition[1] *ga* is generally thought to be a marker of ‘subject’ or ‘nominative’ case. That is it has been understood as a marker of grammatical relations or case (Kuroda 1965, Kuno 1972, 1973a, 1973b, Shibatani 1977, 1990). Examples (1)a and (1)b illustrate this view (Shibatani 1990:258):

(1) a.

Taroo	ga	kita
	NOM[2]	came

‘Taroo came’.

b.

Taroo	ga	hon	o	katta
	NOM	book	ACC	bought

‘Taroo bought a book’.

However, when we examine data from everyday conversations, we find a radically different picture, one that seriously challenges this view of *ga* as a marker of either the ‘subject’ grammatical relation or the ‘nominative’ case, as shown in (2).

(2) *ga* is rarely used in Japanese conversation.
ga is found mostly with ‘S’ NPS, but hardly ever with ‘A’ NPS (Comrie 1978, Dixon 1979).
the appearance of *ga* is associated with marked pragmatic functions.

In this paper, then, we will present evidence to support our claim that *ga*’s function is better understood in terms of pragmatics than in terms of a notion like ‘subject’.

1. Previous discussions of *ga*. In a longer paper (Ono et al., to appear), we discuss a number of previous analyses of *ga*; here we will mention only two of the most influential scholars. Both these scholars’ works are based on constructed examples.

Kuno (1972, 1973a, 1973b), drawing on Kuroda (1965), made three central, and related, points about *ga*:

1. *ga* marks the so-called ‘subject’ (except for ‘objective *ga*’)

2. *ga* can convey an 'exhaustive listing' (or 'singling out') meaning, something like the English 'It is X that Y'; Kuno's example is given in (3)[3]:

(3) John ga dokushin desu
ga single COP
'It is John who is single'. (Kuno 1972:272)

3. *ga* marks 'new' (i.e., unpredictable) information; Kuno's example is the mini-dialogue given in (4):

(4) a. Taroo to Hanako to Natsuko no uchi de dare ga ichiban segatakai ka
and and GEN inside in who *ga* most tall Q
'Who is the tallest among Taroo, Hanako, and Natsuko?'

b. Taroo ga ichiban segatakai
ga most tall
'Taroo is the tallest'. (Kuno 1973b:209)

Shibatani (1977, 1990) suggests that *ga* be thought of as a marker of 'nominative' case, but he notes that 'nominative' does not always match up with 'subject'. Applying a set of independent 'tests' to identify 'subject', Shibatani notes that examples can be constructed to show that some 'subjects' are not marked with *ga*, while some NPS marked with *ga* do not fit the criteria for 'subject'. But in spite of this mismatch, Shibatani believes that *ga*'s function is to mark the 'nominative', and, by implication, that it marks 'subject'.

In this paper, we would like to build on the important contributions made by these and other researchers, but we want to argue that *ga* is primarily a pragmatic marker, having little to do with either grammatical relations or case.

2. DATA AND METHODOLOGY. For our data, we looked at twenty-one audiotaped conversations, totalling more than two hours of talk. These conversations have from two to five participants, all of whom are close friends, couples, or families, and all of whom are adults, speaking standard Japanese. We have both mixed-gender and same-gender conversations.

There were roughly 4000 places where a so-called 'subject' NP, which could be marked with *ga*, could occur. Of these 4000 places, for this paper, we systematically sampled a randomly selected set of 122 places.

3. FINDINGS. Our first finding is that, in contrast to what the literature suggests, *ga* is very rare in conversation. One primary reason for this is that NPS are very rare in Japanese conversation. Table 1 shows that out of 122 places where NP + ga could

Ø	92	(75%)
NP	30	(25%)
total	122	(100%)

Table 1. Places in which a *ga*-marked NP could occur.

bare NP	11	(37%)
NP + another particle	8	(27%)
NP + *ga*	11	(37%)
total	30	(100%)

Table 2. NPs that could take *ga*.

NP + *ga*	11 (11/122 = 9%)

Table 3. Percentage of actual *ga*-marking. (Combination of Table 1 and Table 2.)

occur, 92 of these had no NP at all, due to the pervasive phenomenon of so-called 'zero anaphora' (see Ono & Thompson 1997 and references cited there).

But even more striking are the numbers shown in Table 2. Table 2 shows that just among the 30 NPs from Table 1 that could take *ga*, only 11 of them did so, or about ⅓. 11 of these 30 NPs were 'bare', taking no particle at all, and 8 of them had some other particle.

If we put Tables 1 and 2 together, we have Table 3, which just shows that out of the 122 places where a *ga*-marked NP could occur, a *ga*-marked NP did occur only 11 times, or 9% of the total number of places where a *ga*-marked NP could occur.

Example (5) is a typical example of a *ga*-marked NP from our data. The *ga*-marked NP is in boldface:

(5) (talking about the opening of a new store)
Harajuku ni **Janiizu Shoppu ga** dekita no
Harajuku in Janiizu shop *ga* came:into:being FP
'Janiizu Shop has opened in Harajuku'.

Examples (6) and (7) show typical 'bare NPs' from our data. Again, the bare NP is in boldface:

(6) **omae Ø** nanka takuranden daro
you something plotting FP
'You are plotting something, aren't you?'

(7) **sore Ø** zettai ii
it absolutely good
'It is absolutely good'.

Thus, 'bare NPs', as seen in (6) and (7), are just as common as NPs marked by *ga*.

Our first result, then, is that *ga* is very rare in conversational Japanese. Since we have found so few cases of *ga*-NPs, we decided to add more cases to our database, again based on random selection. Unless specified otherwise, frequency information given from here on is based on 62 NPs (34 *ga*-NPs and 28 bare NPs).

Our second finding is that, contrary to what we would expect from looking at example (1)b, *ga* mainly occurs with 'S' NPs; 94% of *ga*-marked NPs are 'S'. That means that *ga* is hardly ever found with 'A' NPs. This is not what we would expect if *ga* marked either 'subject' or 'nominative'.

There are two reasons for this. The first is that, as we said just above, there are not very many NPs in the data to begin with. Of these, even fewer are 'A' NPs, as we would expect, since 'A' NPs tend to be 'given' information and are more likely to be unexpressed than other NPs (see Du Bois 1987, Iwasaki 1985, Matsumoto 1997, and others). So 'A' NPs simply hardly ever occur in the first place. The second reason is that when an 'A' NP does occur it rarely takes *ga*. In our data only 13% of the overt 'A' NPs occur with *ga*.

To summarize what our conversational data show,

1. *ga* is rare
2. *ga* is largely found with 'S' NPs, but not with 'A' NPs

These two observations both suggest that *ga* is not a well-behaved marker of a grammatical relation of 'subject' or 'nominative' case (as these are described in the typological literature). First, we don't expect markers of grammatical relations or case to be so rare that they are only used in 9% of the places where they 'could' occur, as shown in Table 3. Second, we don't expect markers of grammatical relations or case to be so 'optional' that they are only used with 37% of the NPs that they 'could' occur with, as shown in Table 2. And third, we don't expect markers of a 'subject' grammatical relation or 'nominative' case to occur mostly with 'S' NPs but hardly ever with 'A' NPs.

4. WHAT DOES *GA* DO? Our claim is that *ga* can be best characterized as shown in (8):

(8) *ga* is used to indicate that its NP is an argument of its predicate where there are pragmatic reasons to do so.

That is, we claim that *ga* is found in pragmatically highly marked situations where an explicit signalling of the relationship between the NP and the predicate becomes interactionally relevant. We would like to present 6 pieces of evidence for this claim.

Our first piece of evidence is that, as we have just shown, NPs with *ga* are extremely rare. The norm in Japanese conversation is not to use *ga*, as shown above in Tables 1, 2, and 3. Thus we may hypothesize that when *ga* is used, it is used for a recognizeable pragmatic purpose.

Our second piece of evidence is that *ga* is not likely to be used with expressions referring to 1st or 2nd persons, with 3rd person pronouns, and with demonstratives.[4] 80% of these types of NPs occur without *ga*. Example (9) shows a 1st person pronoun without *ga*.

(9) **Atashi Ø** sore motteta no
I it held FP
'I had it (with me)'.

Example (7), repeated here, shows a demonstrative without *ga*:

(7) **sore Ø** zettai ii
it absolutely good
'It is absolutely good'.

This fact is predicted by our hypothesis: it is reasonable to assume that expressions referring to 1st or 2nd persons, 3rd person pronouns, and demonstratives are rarely used in pragmatically marked situations, because their referents are generally understood in their contexts.

Third, we found that complex NPs tend to be marked by *ga*. By 'complex NPs' we mean either clausal NPs or modified NPs. 80% of such complex NPs are marked with *ga*. An example is given in (10):

(10) (talking about photos)
nanka **nikkori to suggoi kawaiku waratten no ga**
somehow smile with extremely cute smiling NOML *ga*

atta n da yo ne
exist NOML COP FP FP
'There was uh (this) cute smiling one (i.e., photo)'

This fact is also predicted by our hypothesis: In real time, it is reasonable to assume that a complex NP is not easily recognized as an argument of its predicate. There is, therefore, a communicative advantage in marking the complex NP as an argument, thereby providing a signal of the segmentation of the utterance into argument and predicate. This tendency of *ga* to occur with complex NPs would, however, be difficult for the 'subject' hypothesis to explain.

Our fourth piece of evidence for our claim in (8) is that in the data, *ga* is often associated with an 'exhaustive listing' ('singling out') meaning, as suggested by Kuno, and as shown in (11) and (12):

(11)	uchi	tte	hora	**onna**	**ga**	minna	dekai	ja	nai?
	house	*tte*	see	woman	*ga*	all	big	COP	not

'My family, see, women are all big, aren't they?'

Example (12) in an instance of reported speech, where the speaker reports both a question and its answer:

(12)	nani	ni	hairu	n	da
	what	in	enter	NOML	COP

'What (club are you going) to join?'

handobooru	**ga**	ii	ka	na	toka	omotte	toka	tte	sa
handball	*ga*	good	Q	FP	QT	think	QT	say	FP

'"(It's) handball (I want to join), (I) think", (I) said'.

These very typical examples are just what would be predicted by our hypothesis: a context in which one NP is being 'singled out' is typically just the kind of context where we would expect *ga* to be used to indicate that its NP is an argument of its predicate. It should be further pointed out that (12) is also a good example of another common pattern in our data: *ga* appears with 'new' (i.e., unpredictable) information, as suggested by Kuno. Again, 'new' information is just the kind of information which we expect *ga* to occur with, according to our hypothesis.

Our fifth piece of evidence for our claim can be seen if we try to remove *ga* from the clauses where it is used in the data or put it in in the clauses where it isn't used in the data.

If you take out *ga* from those few clauses that have it, you don't lose much. Thus (11) and (12) without *ga* also sound all right to most speakers of Japanese. More strikingly, if you try to mark bare NPs with *ga*, you tend to get an 'exhaustive listing' meaning. So if we look at (6) again, we see the typical bare NP:

(6)	**omae Ø**	nanka	takuranden	daro
	you	something	plotting	FP

'You are plotting something, aren't you?'

If we try to add *ga* to *omae*, we get (6'), which has a strong implication of exhaustive listing, as suggested by our English translation:

(6') **omae *ga*** nanka takuranden daro
you *ga* something plotting FP
'It's YOU that's plotting something, isn't it?'

Again, we take these facts to provide strong support for our claim that *ga* is a pragmatic marker, indicating that its argument is to be understood as an argument of its predicate. At the same time, we take these facts as fairly strong support against the claim that *ga* is a grammatical marker of 'subject'. If *ga* marked 'subject', the fact that we get such noticeable shifts in pragmatic interpretation when it is added or omitted would be very unusual.

Finally, as our sixth piece of evidence, we note that *ga* is often found in contexts where the identity of a referent as an argument of its predicate is under negotiation, as shown in (13), where A makes a generic statement, but B asks who A specifically has in mind (square brackets indicate that both A and B are speaking at the same time):

(13) A: 'meshi! okane!'
meal money
sore dake kkya iwanaku naru mono ne, [dandan]
it only only say:not become NOML FP gradually
'"Meal! money!" (kids) gradually get so that is all they say'

B: [dono ko]?
which child
'Which kid?'

A: a, ue, **oniichan ga**
uh older older:brother *ga*
'Uh, older, your older brother'.

Again, we believe that interactional situations like that exemplified in (13) strongly support our hypothesis that *ga* is primarily used in contexts where there is a pragmatic advantage to marking its NP as an argument of its predicate. Contexts in which a referent is being negotiated like that shown in (13) are precisely one such situation.

5. CONCLUSIONS. In conclusion, we hope to have convinced you of two points in this paper. Japanese *ga* is not a marker of 'subject' or 'nominative'—i.e., a marker of grammatical relations or case. Rather, the conversational data provide clear evidence in favor of a different hypothesis: *ga* can best be characterized as INDICATING THAT ITS NP IS AN ARGUMENT OF ITS PREDICATE WHERE THERE ARE PRAGMATIC REASONS TO DO SO.

[1] We are grateful to Shin Ja Hwang, anonymous reviewers, and the audience at the LACUS conference for valuable input in the preparation of this paper.

[2] The following abbreviations are used: ACC=accusative, COP=copula, FP=final particle, GEN=genitive, NOM=nominative, NOML=nominalizer, Q=question, QT=quotative, and TOP=topic.

[3] Glosses and translations in examples (3) and (4) are by the authors of this paper.

[4] Expressions referring to 1st and 2nd person in Japanese are sometimes not pronouns, but various types of lexical NPs.

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SYNTACTIC ENCODING OF INFORMATIONAL DISTINCTIONS IN NUGUNU

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In this paper I propose that Nugunu, a Bantu language of Cameroon, syntactically marks verb phrases to indicate that they are to be interpreted as presupposing that the proposition they encode has been entered into the discourse context prior to the utterance containing the marked verb. Nugunu thus syntactically distinguishes between vp's which constitute the main, informative part of a clause and those whose primary purpose is as grounding material. I assume a distinction between focus and ground along the lines of what is proposed in Vallduví (1992). According to Vallduví (among others), the focus of a clause is the material which contributes something to the knowledge store of the hearer. The ground, on the other hand, indicates how the focal material is to be entered into the hearer's knowledge store. I also assume a dynamic model of meaning, File Change Semantics, first proposed in Heim (1982) and revised in Heim (1992) and in Portner and Yabushita (1998) (see also Reinhart 1982). In this framework, the meaning of a sentence is taken to be the effect it has on the context. Individuals introduced in a discourse are paired with sets of worlds, forming sets of infinite sequences of entity/set-of-worlds pairs. When a new sentence is uttered, any sequences not compatible with the new information are eliminated from the context. This device formally captures the intuitive idea of a filing system, whereby discourse entities are likened to file cards on which is recorded the asserted content of the utterances referring to those entities.

Evidence for the proposal that the informational status of verb phrases is syntactically marked in Nugunu comes largely from the behavior of wh-clauses and is supported by data from related structures such as relative clauses and contrastive focus constructions. Wh-words in Nugunu may be preposed, as in English, or may remain in situ. Furthermore, the verb in wh-in situ questions may have either of two forms. There is thus a three-way variation in the possible syntactic representations for these questions. Example (1) illustrates the three structural possibilities for the question 'What does the child want to eat?'. Note that the verbs in (1)a and (1)b have an additional morpheme, labelled df, which is not present in (1)c.

(1) a. Preposed wh-word: Ŋkádɛ moɔnɔ́ a-lɛ́galɛga-mɔ́ go-nyáa?
what child 3S-like-DF INF-eat

b. In situ, marked verb: Moɔnɔ́ a-lɛ́galɛga-mɔ́ go-nyáa ŋkádɛ?
child 3S-like-DF INF-eat what

c. In situ, unmarked verb: Moɔnɔ́ a-lɛ́galɛga go-nyáa ŋkádɛ?
child 3S-like INF-eat what
'What does the child want to eat?'

I will show that the presence or absence of the DF morpheme indicates whether the VP is to be interpreted as primarily background, organizational material or as the main, context-changing information of the clause. In particular, I am proposing that the DF morpheme instructs the hearer to treat the proposition encoded in the VP as though it were presupposed, having already been associated with a discourse entity in the current discourse. That is, this proposition is to be used as grounding material (in the sense proposed in Vallduví 1992) whose purpose is to enable some other element in the utterance to be correctly related to the context.

Wh-questions with the verb form shown in (1)a and (1)b above belong to a group of five constructions which differ syntactically from all other structures in Nugunu. These constructions also include contrastive focus clauses, relative clauses, adverbial clauses with relative pronoun-like heads, and certain identificational clauses. These five clause types share a verbal marker, the DF (defocalizer) morpheme, which is not found in any other clause types.[1] The examples below are illustrative ((2)a shows the unmarked verb form for purposes of comparison).

(2) a. A-námbɛna onɔ́má bɛmmɛ́ka. (typical assertion)
3S-cook husband manioc
'She cooks manioc for her husband.'

b. Bɛmmɛ́ka bɛ́ɛ a-námbɛna-mɔ́ onɔ́mɛ. (contrastive focus)
manioc FOC 3S-cook-DF husband
'It is manioc that she cooks for her husband.'

c. bɛmmɛ́ka bɛ́ɛbɛ a-námbɛna-mɔ́ onɔ́mɛ… (relative clause)
manioc that 3S-cook-DF husband
'the manioc that she cooks for her husband…'

d. aŋa a-námbɛna-mɔ́ onɔ́mɛ bɛmmɛ́ka… (adverbial clause)
when 3S-cook-DF husband manioc
'when she cooks manioc for her husband…'

(2) e. Bɔ́ɔbɔ bo-lɔ́-mɔ́ bɛmmɛ́ka. (identificational clause)
this it-be-DF manioc
'This is manioc.'

In this paper, only relative clauses and contrastive focus constructions will be considered along with wh-clauses. The DF-marked adverbial clauses in Nugunu appear to be a type of headless relative, and the syntax and semantics of identificational clauses in this language await further research.

Hamblin (1973) takes the interpretation of a question to be the set of propositions which could serve as an answer to it. So, for example, the meaning of the English translation of the questions in (1) above would informally be the set of propositions {the child wants to eat manioc, the child wants to eat couscous, the child wants to eat rice,...}. Each of the questions in (1) has the same propositional content, despite the differences in surface form. The question and the members of the set of potential answers to it all entail (at least as far as the speaker's model of the hearer's knowledge store goes) a proposition of the form 'the child wants to eat *x*', an open proposition. These questions also presuppose that the child wants to eat something; that is, this proposition is present in the context by virtue of the meaning of the question (i.e., the set of potential answers to the question). Since each of the questions in (1) contains both the same open proposition and the same presupposition, it might seem at first glance that the DF morpheme in (1)a and (1)b is marking that one or both of these are present. (For an argument to that effect regarding a similar phenomenon in Ejagham VP's, see Watters 1982.) However, the question in (1)c does not contain the DF morpheme, even though it, too, entails an open proposition and presupposes that the child wants to eat something. It must be the case, then, that this morpheme does not mark either the presence of an open proposition or of the basic question presupposition. Some other distinction is at issue. I will argue that the DF morpheme marks that the proposition 'the child wants to eat something' has the status of ground material.

The contribution of the DF morpheme may be brought out by first considering typical assertions with unmarked verbs, what I will call here a default assertion.

(3) a. Okɔ́dɔ ɛ-ɛ́da naá dɔ́bɛ́dɔ.
woman 3s-go to hospital
'A woman goes to the hospital.'

b. Okɔ́dɔ moánɛ a-bíene moɔnɔ́.
woman same 3s-bear child
'This woman bears a child.'

In (3)a, the entire sentence adds information to the context. The subject NP introduces a new discourse entity, and the VP asserts something about that entity. In terms of the file card metaphor, the subject introduces a new card, and the VP adds an entry under that card. The subject in (b) has already been introduced and so adds nothing more. The VP, however, adds another entry, so to speak, to the file card represented by the subject. These two sentences represent the type of construction in Nugunu in which the unmarked verb form appears. In both cases, the primary purpose of the VP constituent as a unit is to add information to the context. In terms of Portner and Yabushita's (1998) version of File Change Semantics, the content of the VP would update the discourse context by eliminating any sequences of entity/set-of-worlds pairs which were not compatible with it.

A variation on the basic default assertion clause in Nugunu is the topicalization construction, shown in (4).

(4) Bɛmmɛ́ka bɛ́ɛ dɛ-nyáanana.
manioc TOP 3S-eat.
'The manioc, we are eating.'

Notice that the verb has the same form as the verbs in (3), without the DF morpheme. This VP has the same effect on the context as do the VP's in the default assertion structure—it adds new information, eliminating incompatible sequences. The difference in this structure is that an element other than the subject serves as the entity with which the information in the VP is associated. That is, a non-subject constituent provides the 'file card' on which the new entry is recorded. On the assumption that topicalization structures involve movement of either an overt or covert element (as in Chomsky 1977; Lasnik & Saito 1992), this structure demonstrates that the question of syntactic movement is not relevant to the appearance of the DF morpheme.

In the discussion that follows, I will be using the term 'focus' as it is described in Vallduví, who draws on the work of Halliday and authors in the Praguean tradition. The focus of a clause is 'the only informative part of the sentence… the only nonelidable part of the sentence, since it is the only contribution to the hearer's knowledge-store at the time of utterance (or so the speaker assumes)' (1992:46). Although focus in this usage pertains only to assertions, clauses of other types contain constituents which parallel focal elements in the sense that they encode the main communicative element of the clause, the element which actually furthers the speaker's communicative goal. In an assertion, for example, the goal is to contribute material to the context. The focus of the clause is the material that is to be added. In a wh-clause with a DF-marked verb, however, the communicative goal is to find a value for the variable represented by the wh-word. It is the wh-word which carries forward the communicative purpose of the speaker. The rest of the material in the clause simply encodes a proposition in relation to which the value is sought. This is why, for example, in a context where someone has just uttered a sentence like 'Oh, he's not in his office' out of the blue, a speaker might only respond with 'Who?'.

The important element in the second utterance—the wh-word—is all that is needed to convey the speaker's intentions, and the rest of the utterance may be elided, being recoverable from the context. Thus, wh-clauses are parallel to assertions in that they contain both a communicatively central element (the wh-word) and material which relates this element to the existing context. This parallel between assertions, with a focus-ground distinction, and other types of clauses should be borne in mind throughout the paper, since I will be using the term 'ground' to mean the same thing in relation to assertions and to wh-clauses and contrastive focus constructions.

The default assertion may now be compared to DF-marked constructions. Consider first a contrastive focus clause (roughly equivalent to a cleft in English). (5)a gives an assertion in reaction to which (5)b is uttered.

(5) a. A-dúenene bɛmmɛ́ka.
3S-sell manioc
'She is selling manioc.'

b. Akɛ́, a-duàenene-mú olɛ́sɛ.
No 3S-sell-DF rice
'No, it is rice that she is selling.'

(5)a creates a context in which only sequences compatible with the subject selling manioc are allowed. The sentence in (5)b, however, does not further add to that context that the subject is selling rice. Rather, it revises the existing context by eliminating sequences in which the subject sells manioc and replacing them with those in which the subject sells rice. Thus, the update of the context by a VP with a marked verb involves an operation other than simply adding information. Moreover, the contrastive focus construction crucially entails a proposition which has been previously entered into the context. In (5)b, the proposition 'she sells something' had already been introduced through the utterance in (5)a.

Consider now a relative clause. The example below is the opening line of a narrative:

(6) Mɔtɔ mɔ́ɔnyɔ ɛ-ɛ́da-mɔ́ go-úle…
man who 3S-go-DF INF-come
'There was this man who arrived…' (lit. 'a man who arrives')

The information that there was a particular man who came to the speaker's village was assumed by the speaker to be unknown to his audience. Thus, the relative clause in this example actually changes the context by adding new information. Since this clause, like all relative clauses, is obligatorily marked with the DF morpheme, this example might seem to be a counterexample to the claim that DF-marked VP's encode presupposed material. However, note that the information in this relative clause may well be added indirectly, through a process of accommodation as described in Heim (1982). That is, the hearer must backtrack, alter the context set by adding the information that a man arrived, then go on to process the NP with its relative clause. The primary operation of the VP in this relative clause, therefore, is not to change the context. Rather, it functions to limit the value for the variable represented by the relative pronoun 'who' to someone of whom having come to the speaker's village is true. That is, the VP identifies a proposition ('x came') which can be used to correctly characterize a set. The VP in this construction thus contrasts with VP's in default assertions in that it serves to facilitate some other communicative goal (such as identifying a referent) rather than to primarily expand the context.

In considering the wh-questions in example (1), I ruled out the possibility that the DF morpheme marks either a basic presupposition or an open proposition. Although both the contrastive focus clause and the relative clause in the above two examples can be argued to contain a presupposed proposition, this is not why the DF morpheme appears. Considering (5) and (6), two characteristics of DF-marked VP's are evident. First, they do not directly add information to the context. If new material is involved, some additional process such as accommodation or replacement of previously entered material is required. In this respect, all or part of the material encoded in marked VP's is treated by the speaker as though it had been previously associated with a discourse entity during the current discourse. Second, they are not the central, communicative element within their own clause; in relation to other clause-level elements, they serve a facilitating role. In contrast to DF-marked VP's, on the other hand, the VP's in default assertions both directly add information to the context and are the focus of their clause. The DF morpheme thus marks that a VP does not function as in a default assertion. It acts as a 'defocalizer' (hence the label DF), causing the VP to be interpreted as grounding material in relation to some other element within the clause, rather than as information which will expand the context.

Viewing the DF morpheme as a VP defocalizer would predict that unmarked VP's in wh-in situ clauses (like (1)c) can function like focal elements, sharing characteristics with asserted VP's. They should be able to add new information directly to a context. The question in (1)c, for example, would expand the context by entailing a proposition, 'She wants to eat something', creating an entry under the subject NP 'child'. The fact that the wh-word induces a presupposition that the child wants to eat something is separate (at least in Nugunu) from the issue of whether this proposition is to be interpreted as having existed in the discourse prior to the utterance of the question. Thus, a wh-question does not necessarily presuppose that an entailed or presupposed proposition existed in the context prior to the utterance of the question. This additional presupposition is introduced by the DF morpheme.

The prediction that VP's in unmarked wh-clauses share characteristics with those in default assertions is, in fact, consistent with the way these wh-clauses are used. Although differences in marked and unmarked wh-in situ clauses are subtle and difficult for non-native speakers to pin down, the following example from a naturally occurring interaction shows that they are indeed distinct. While visiting a Nugunu speaking family, I addressed the following appropriate and grammatically correct question to a small child who had begun to cry:

(7) O-baŋa ŋkádɛ?
2S-cry what
'Why are you crying?' (lit.'What pain/sorrow/loss/etc. are you crying?')

An older woman who was present wished to chide the child. In a stern voice, she rephrased my question as in (8), using the DF-marked verb form:

(8) O-baŋa-mɔ́ ŋkádɛ?
2S-cry-DF what
'Why (is it that) you are crying?'

The older woman's question allowed for an implicature that the child had nothing to cry about (similar to *What are* you *crying about* in English), whereas my question could only be taken as a legitimate request for information. The form of the question in (7), using an unmarked verb, treated the child's crying as a topic new to the discourse. It caused the proposition that she was crying for some reason to be added as an entry on the child's file card. The question in (8), on the other hand, treated the proposition 'You are crying' as though it had already been associated with the child in the discourse. It therefore had no communicative value except to provide a proposition in relation to which 'what/why' was relevant. The marked verb form thus shifted the focus of the clause from the entire VP to the NP argument of the verb, allowing a different communicative goal to be achieved from that of the unmarked question. Exactly how the implicature created by (8) arises is unclear.

The difference in the effect of the marked and unmarked VP's in Nugunu wh-questions may be brought out by comparing a wh-question in English to its clefted counterpart. Imagine a context where a mother returning from work is talking with her child's babysitter. The sitter has just finished telling her about their trip to the zoo. The mother responds:

(9) Oh that's great. What did she have for lunch today?

The question in (9) certainly presupposes that the child ate something for lunch. However, it introduces a new topic of conversation and in no way implies that the proposition 'she ate something for lunch' was part of the information previously associated with the child in the preceding discourse. Suppose now that the mother had followed the sitter's story with,

(10) What was it that she ate for lunch?

This question would be somewhat odd unless the topic of lunch had come up in earlier remarks or been introduced implicitly in some other way. The clefted wh-question creates the distinct impression that the proposition encoded in the subordinate VP has already been associated with the discourse entity for the child prior to the utterance of (10). The contrast in the effect of these two question forms in English demonstrates that a factor beyond the presupposition that she ate something is at work in (10). The clefted question carries an additional presupposition that the proposition in the subordinate clause already exists in the discourse. Thus, the clefted question requires a context in which the proposition encoded by the VP has already been associated with a discourse entity, while the non-cleft wh-question has no such requirement and so may introduce a new topic.

The distinction between marked and unmarked wh-questions in Nugunu is similar to the cleft/non-cleft contrast in English wh-questions. The unmarked wh-question in Nugunu does not require that the material in the VP be treated as though it previously existed in the discourse. The DF-marked question, on the other hand, does.

One question that arises from the preceding discussion is how a presupposition is to be distinguished formally from a proposition that is treated as though it had been previously associated with a discourse entity. Although a full discussion of this question is beyond the scope of this paper, one point may help clarify the difference in the two concepts and indicate the direction for a formal solution. If verbs are taken to have event arguments (as in Davidson 1967), these arguments may behave like other discourse entities in being paired with sets of worlds. An event argument could then be either a newly introduced entity similar to an indefinite NP or a previously introduced entity like a definite NP (see Baker & Travis 1997 for discussion of a definite-indefinite distinction in Mohawk verbs). In the latter case, it would serve as grounding material, just like a definite NP argument. A DF-marked verb would therefore have an event argument which is to be taken as a previously established discourse entity. The DF morpheme would signal the hearer to find (or 'go to', in the words of Vallduví) the discourse entity indicated by the VP. This morpheme would thus have a function relative to event arguments which is similar to that of the definite article relative to nominal arguments in English—any DF-marked verb would have an event argument taken to have been entered into the current discourse context prior to processing the utterance containing the DF morpheme. Having a presupposed event argument is not necessarily true of all VP's containing presuppositions, however. One might open a conversation with a colleague, for example, by saying something like 'John repeated a serious error today,' which presupposes that John has made a serious error in the past. It does not also presuppose, though, that the verb's event argument has already been established in the discourse. Note also that this presupposition follows from the lexical meaning of 'repeat' and enters the context through accommodation or some other process of inferencing; it does not arise from a functional element indicating that some discourse entity is to be treated as part of the previously existing discourse structure.

The examples discussed in this paper have shown that the presence of the DF morpheme in Nugunu verb phrases cannot be attributed to either a basic presupposition (of the type arising from a wh-clause or cleft construction, for example) or an open proposition, nor can it be attributed to syntactic movement. In Nugunu, a verb phrase is marked by a defocalizing morpheme when it does not function by default to add information to the context. DF-marked VP's are then interpreted as encoding material which had been entered into the discourse prior to the utterance containing the marked VP. The purpose of this material is to indicate how the central communicative material of the clause is related to or entered into the context. Thus, DF-marked VP's in Nugunu manifest syntactic marking of the notion of 'ground', as described in Vallduví (1992).

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[1] The form of the morpheme actually varies according to tense. For simplicity, only present tense verbs will be used in examples.

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FORENSIC ASPECTS OF DISCOURSE ANALYSIS

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Linguists, like academics in many other fields,[1] are often challenged to explain the 'relevance' of their areas of research to the public. A common and quite reasonable response to such a challenge is that research is undertaken for its own sake, in pursuit of knowledge and a fuller understanding of ourselves and the world, without any directive to make the research somehow applicable. The fact that pure research may in fact find some particular relevance is typically not what guides the researcher. In this paper, however, I wish to present a case for an 'applied linguistics' which does in fact result from pure research. In particular, the use of linguistic methods of analysis, and of discourse analysis in particular, are examined in terms of the contributions they can make in the courtroom.

This paper discusses recent court cases in which the author was called as an 'expert witness' in linguistics and was asked to apply the methods of discourse analysis to specific texts (taken from Internet sites and dial-in telephone message sites) which were alleged to communicate homophobic, racist, and anti-Semitic messages. First, a couple of illustrative messages are presented, after which we turn to the relevant linguistic methods which can be used for an analysis of the materials. Sample analyses taken from actual cases are then presented, and we show how well established methods of linguistic analysis can assist in the courtroom in determining the status of the allegations. We close with a brief discussion of how the analyses are received in the courtroom and finally, with comments on the broader role of linguistics within a forensic setting.

1. Hate Messages. The *Canadian Charter of Rights and Freedoms* contains a section which protects people of 'identifiable groups' from verbal abuse through the use of print media or via telecommunication means. The relevant section, 13(1) states:

> It is a discriminatory practice for a person or a group of persons acting in concert to communicate telephonically or to cause to be so communicated, repeated, in whole or in part by means of the facilities of a telecommunication undertaking within the legislative authority of Parliament, any matter that is likely to expose a person or persons to hatred or contempt by reason of the fact that that person or those persons are identifiable on the basis of a prohibited ground of discrimination.

In 1993, the author was contacted by the Canadian Human Rights Commission (CHRC) and asked if he would be willing to assess a set of transcribed dial-in telephone 'hate messages' aired by a British Columbia group called the Canadian Liberty Net. The messages were aimed primarily at homosexuals and people of color, and they urged violence against such people. It was alleged by the CHRC that such messages contravened the *Charter*. Analyses were provided of the messages, and the author testified as an expert witness before a tribunal of the Canadian Human Rights Commission.

In 1995, the author was again asked by the CHRC to provide analyses of another set of dial-in hate messages, this time directed primarily against Jews, promulgated by a small right-wing quasi-religious group which called itself the 'Church of Christ in Israel', alleged to be an affiliate of the white supremacy group called the Aryan Nations. Again, the author carried out analyses of the messages and testified as an expert witness before another tribunal of the Canadian Human Rights Commission to the effect that such texts were indeed anti-Semitic.

Finally, in 1997, the author was asked by the CHRC to analyze an extensive set of materials taken from a web site called the Zündelsite, for the same purposes. This set of materials ran to about 150 or so pages, and consisted of materials posted on the site. The materials were dedicated to a 'Holocaust denial' program carried out by a small group of marginalized individuals who deny that the Holocaust ever took place, and that the real aggressors in World War II were not the Nazis but rather the Jews. Here are three examples of materials taken from that web site.

(1) To claim that World War II was fought by the Germans, as the Holocaust Lobby incessantly claims, just to kill off the Jews as a group, is a deliberately planned, systematic deception amounting to financial, political, emotional and spiritual extortion. The 'Holocaust', first sold as a tragedy, has over time deteriorated into a racket cloaked in the tenets of a new temporal religion - replete with martyrs to the Faith, holy shrines, high priests like Wiesel and Goldhagen, and theologians of the Faith such as Raul Hilberg, Deborah Lipstadt et al. (*An open letter from the 'Zündelsite' to all principled freedom-of-speech activists globally*: 2)

(2) Remember Jewish Professor W.D. Rubenstein of Australia who wrote in Sept. 1979, 'If the Holocaust can be shown to be a "Zionist myth", the strongest of all weapons in Israel's propaganda armory collapses'. Knock that shield away, and they will have no choice but to defend themselves on their own merits. Without the self-bestowed 'victim' status and without their copyright on pain and suffering, they will be revealed to be a rather paranoid, shrill, whining group of shysters, common racketeers, distorters of history, falsifiers of documents who

> created a gangster enclave in the Middle East called Israel to which thieves, crooks, swindlers, real estate and stock market frauds and Mafia king pins like Meyer Lansky, Flatto Sharon and thousands of others can retire to a safe haven. From there they can send forth their hit men and assassination squads, riding in bombers or on the backs of tanks, terrorizing their neighbors or even individuals in far off lands, sometimes even governments or heads of state. (*Zündelsite—Power letter*. July 1996).

> (3) The day of global reckoning is dawning. The Jewish Century is drawing to a close. The Age of Truth is waiting to be ushered in, and we will be its ushers. (*Zündelsite—Power letter*. July 1996).

It is perhaps self-evident that these passages, and they are quite representative of the 33 different documents contained in the materials, are blatantly anti-Semitic. Yet, for the court, or the CHRC Tribunal in this case, the issue can never be on the first test self-evident. Rather evidence must be adduced in support of the charge. So the question for the linguist is: Where do we start? What sorts of methods and tools need to be assembled, and what are the academic warrants of such methods? It is to this task that the next section is devoted.

2. ANALYTIC METHODS. When broaching such a loaded issue as whether or not a particular statement is anti-Semitic (and therefore offends the *Charter*), it is no good simply to state the obvious in an ad hominem fashion. Instead, an established body of independent scholarship must be brought to bear on the issue.

The starting point is the recognition that discourse is a complex of social, psychological, and linguistic phenomena subject both to principles of grammar, which all speakers of a language know implicitly, as well as to the general principles of discourse organization, which speakers also command. An extended stretch of language, such as we find in conversations, narratives, polemical statements, political speeches, etc., is not just a string of sentences, one following the other. Rather, such a *text* exhibits properties which reflect its presuppositions, assumptions, organization, coherence, rhetorical force, thematic focus, etc. In written discourse, the writer constructs the text and provides it with a more formal and coherent structure, often through the use of various linguistic, stylistic and rhetorical devices. The reader faces the task of constructing an interpretation from that text. One important aspect of such interpretations is the fact that the author guides the reader via the use of various linguistic strategies and structures to imbue the representation with far more information than that which is overtly present.

A large body of scientific research has developed which examines how speakers construct and how hearers interpret discourse. This research draws upon such diverse areas of our discipline as syntax, lexical analysis, pragmatics, discourse

Principles	**Relevant Components and Functions**
Pragmatics	Grice's (1975) Cooperative Principle (and Four Maxims) Sperber & Wilson's (1995) Relevance Principle shared cultural and world knowledge (Green 1989; Levinson 1983; Leech 1983)
Lexical Selection	reveals speaker/writer attitudes (Brown & Yule 1983) contains propositional information (Renkma 1993) reflects presuppositions (Levinson 1983; Blakemore 1992)
Information Management	fore-/background information (Givón 1993) given (shared) or new information (Prideaux 1993) bridging functions for coherence, cohesion (Givón 1983)
Semantics	lexical and sentential meaning, propositional content, inference, entailment, semantic relations (synonymy, etc.), speech act functions (Green 1989; Sperber & Wilson 1995; Renkma 1993)
Syntax	principles of sentence organization, anaphora, quantification, etc. (Fox 1987; Renkma 1993)
Rhetorical Structure	strategies used to build or refute an argument; strategies of persuasion (van Dijk 1984, 1992; van Dijk et al. 1997; Greenberg 1988)

Table 1. An analytic toolkit for discourse analysis

coherence and cohesion, argumentative rhetorical devices, processing considerations, and others. It was this set of materials that were brought to bear on the disputed texts.

Rather than recapitulate the steps I went through in putting the resulting set together, I wish simply to present its outline. Table 1 specifies the areas of linguistics which were found to be relevant in undertaking the analysis, along with a characterization of those aspects of each field which could be brought to bear.

While it is clearly the case that the rough taxonomy of Table 1 could be reorganized in a variety of ways, for our purposes this toolkit is a useful starting place even though many details remain to be spelled out. However, the last topic, that of rhetorical strategies, plays an enormous role in much polemical writing and argumentation. Following, e.g., van Dijk (1984, 1992) and van Dijk et al 1997, it is useful to define some of the more centrally important of these. Table 2 contains a short list of some major argumentative strategies.

Strategy	Description
Targeting strategy	a particular group or entity is singled out, to which some particular characteristics are attributed
Reversal strategy	a particular expression with its commonly held meaning is inverted, such that its meaning changes to its opposite, as in instances in which victims are changed into aggressors and aggressors become victims
Code strategy	exploits lexical selection and often uses metaphor to establish a series of expressions laden with negative associations in order to construct a network of interrelated and often interchangeable terms
Generalization strategy	the attributes of a particular instance are projected upon the superordinate category and generalized to all members of that category
Alibi strategy	involves the equivocal use of terms, in which important expressions are given a special, often restrictive definition in one location and are then used subsequently and without notice in a different, often broader, meaning to lead to logically untenable and misleading conclusions.

Table 2. Some common rhetorical strategies

At this point, the sample texts can be addressed directly, using the toolkit we have assembled above, along with the particular strategies found in Table 2. It is to some sample analyses that we now turn.

3. SAMPLE ANALYSES. We begin with the first passage (1) above. In the first sentence, the verb *claim* is used. This verb takes as its complement a clause whose truth is asserted as a part of the belief system of the writer. That is, the writer asserts that 'the Holocaust Lobby claims that World War II was fought just to kill off Jews'. Notice that no warrant for this assertion is given, but in order to interpret the sentence appropriately, the reader must, by the principle of relevance and the maxims of the cooperative principle, ascribe to the truth of that assertion. Yet if the assertion is not true, then the argument fails.

Secondly, the term *Holocaust Lobby* is capitalized, inviting the reader to believe that such a formal organization actually exists, but without evidence, thereby violating the maxim of quality (truthfulness). Moreover, the author implies (via the principle of relevance) that the membership of the Holocaust Lobby includes Jews, to whom the author ascribes a host of negative qualities through the use of the term *extortion*. Thus Jews are targeted with the code term *Holocaust Lobby* and as a group they are maligned through the generalization strategy. As a result, the first sentence enables the covert assertion that Jews as a group are deceivers and extortionists.

In the next sentence the term *'Holocaust'* is placed in scare-quotes (van Dijk 1992), thereby distancing the author from the conventional meaning of the term via the alibi strategy. This sentence contains a truncated passive relative clause *first sold as a tragedy* without an overt agent. Such agentless passives are typically used when the agent is shared (given) information or is available pragmatically from the context. By the principle of topic continuity and the maxim of relevance, the understood agent here is the NP the Holocaust Lobby, which was introduced in the previous sentence.

In that same clause, the author uses *sell* in a metaphoric sense of *promote* or *convince*, but it also assumes attributes of shady, illicit, hucksterism, in collocation with the other negative terms of the sentence (e.g., *deteriorate*, *racket*). Such a negative set of attributes is one stereotypically associated with Jews in much anti-Semitic discourse.

The author's implicit assertion in the second sentence is that Jews, cast as deceivers, deliberately promoted a false notion, namely that the Holocaust took place, and, as the predicate of the second sentence (*has over time deteriorated into a racket…*) emphatically reinforces that such activity is illegitimate. Moreover, the author then cynically ascribes those who assert the truth of the Holocaust a set of beliefs, a *temporal religion*, which is asserted to be a dishonest *racket*. Here too there is no evidence adduced, but the cooperative principle would lead the reader to assume, as in usual cases of such rhetoric, that there is evidence, since the reader does not a priori assume the writer to be a liar.

The thrust of this passage is to establish the falsehood of the Holocaust, to treat this falsehood thereafter as a shared, given information, to establish a negative code term for Jews (the *Holocaust Lobby*), and to assert the continuing bad faith and evil designs of those who assert that the Holocaust took place. As we can see, a great deal of implicit information is packed into these two sentences, information which every reader somehow recognizes even if the author claims he did not engage in anti-Semitism. The result, we see, is a clear case in which the author has without evidence asserted that Jews as a group are engaged in nefarious activities. Through the use of our toolkit, we have been able to unpack that information in a fairly straightforward way.

We turn now to the second passage, which exhibits some different properties, but nevertheless can be analyzed along much the same lines as the first. Here we will find the use of the targeting, code, and generalization strategies, and a strong reliance on the reversal strategy.

In the first paragraph, the writer focuses on the Jewishness of one Professor Rubenstein, but does not identify his work, yet quotes from him without citation. The reader is therefore provided no context in terms of which to assess the quotation. There appear however to be at least two distinct and conflicting possible interpretations. First, Professor Rubenstein could be *defending* the truth of the Holocaust and pointing out that the deniers are attempting to present the Holocaust as a Jewish myth. Second, he could be *attacking* the truth of the Holocaust and urging that it be seen as a product of Jewish propaganda. Since nothing would be served in the first interpretation, the writer invites the second, which is strengthened by the next sentence in which the Holocaust is cast as a *Zionist myth* shielding Jews. Using the generalization strategy, the writer has quickly and fluidly moved from Zionists to all Jews.

In the second and third sentences, the pronouns *they* and *their* have no overt antecedents, so the reader is forced to construct a referent. Following upon Sperber and Wilson's (1995) relevance principle, the reader constructs the naturally invited referent *the Jews*, which of course is congruent with the context. Next *they* (Jews as a group) are attributed with a series of negative characteristics (*shysters*, *gangsters*, *racketeers*, *distorters of history*, *falsifiers*, etc.) by first targeting the group and then generalizing to all its members.

Within the third sentence, the writer invokes the names of two 'Mafia king pins', Meyer Lansky and Flatto Sharon, then quickly moves to extend the group of such criminals to 'thousands of others' with absolutely no evidence cited, thereby violating the fundamental maxims of quality and manner. In the same paragraph, *they* (the Jews) are asserted to have created a corrupt state (*Israel*) which conceals evil activities and which has adopted a state policy of providing *safe haven* to criminals. Again the generalization strategy is used.

It is interesting to note that Jews are never overtly mentioned in this passage. Nevertheless, they are invoked by the principle of relevance, as the antecedent of *they*, through the code terms *Holocaust*, *Zionist*, and *Israel*. However, rather than the Jews being victims of the Holocaust, they are cast throughout as the aggressors, via the reversal strategy.

Finally, in the third passage, the writer contrasts the *Jewish Century* with the *Age of Truth*. This use of contrast itself constitutes a rhetorical device which pits the two terms against each other along the dimension of truth. The contrast implies that the present 'Jewish Century' is dominated by lies. Moreover, the pronoun *we* also needs an interpretation, and the relevance principle invites the interpretation that *we* refers to those who oppose some (unstated and ill-defined) Jewish position. If *we* is read in the inclusive sense, the reader is allowed to be a member of the writer's group, joining those who oppose any positions and views held by the targeted group. Finally, one can see here an implicit threat to Jews, the details of which remain unstated and therefore potent. A threat of violence is not excluded.

In these three short examples, we have seen how the methods of discourse analysis can be applied to rhetorical passages to bring forth many of the hidden assumptions and added meanings. Throughout the 33 passages analyzed in this project, several recurring themes emerged. Perhaps the most obvious is that invoked by the *reversal* strategy, in which the Jews are portrayed as aggressors and the Nazi government of the Third Reich as victims of the Jews, not unlike much of the Nazi propaganda from that period. Secondly, Jews are grouped together via various *code* terms (*Zionists*, *Marxists*, *Old Order of Bankers*, etc.), then they are targeted as criminals, etc. The reader is invited to treat all Jews alike, via generalization, and then to assign to them a constellation of negative characteristics, many of which are familiar from a long history of anti-Semitism, especially as advocated by some fundamental Christian groups, including many associated with white supremacy groups such as the Aryan Nations.

4. CONCLUSIONS. The examples here could be (and actually have been) subjected to further and more detailed analyses. It is however important to recognize that such principles can be applied to any rhetorical or polemical text, regardless of its particular orientation. That is, the approach taken here is neutral with respect to the content of a passage. If one were to replace negative adjectives, for example, with positive ones, the same strategies would apply, but with different results.

More to the point, however, is the fact that the methods of linguistic analysis from a variety of our subdisciplines can contribute in important ways to the social fabric of our culture. But along with this contribution can also be potential problems. For example, in the courtroom context, discourse is not necessarily of the sort familiar to academics. We tend to be comfortable in intellectual exchanges and civil debate, where ideas are freely exchanged and are debated within a generally respectful and collegial atmosphere. And we typically do not find ourselves comfortable in debates in which we are limited in how we can respond and participate.

The courtroom context is quite different, especially for witnesses. For example, a witness may be qualified as an expert in one area, then may be asked questions in another, where the witness might have personal opinions but not expert ones, from the point of view of the court. Similarly, in cross-examination, a hostile attorney is typically not trying to get at a witness' information or opinion, but rather is simply trying to discredit the witness, using whatever means he or she can. Such behavior is typically viewed by academics as irrational, offensive, and irresponsible. Yet a witness' role is to answer questions, not to make pronouncements. Thus, caution must be observed by expert witnesses in cross-examination, lest the testimony be subverted by irrelevant and ad hominem statements.

In the three cases in which the author has taken part as an expert witness, positive results have emerged. In the first two cases, the Canadian Human Rights Commission was successful in having the hate message centers closed, and much of the evidence adduced by the tribunals for their decisions was that which was provided by the author. The third case, from which the present examples are taken, is still in progress. Its resolution will have a major influence on similar future cases in Canada, and it might well also provide a landmark decision for other countries which are grappling with the issue of hate messages on the Internet.

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[1] I am grateful to the Canadian Human Rights Commission, and especially to Mr. Eddie Taylor, counsel for the Commission in these cases, for permission to use the materials found in Tables 1 and 2. I am also grateful to Dr. Mark Freiman for his insightful comments, as well as to my colleagues in the discourse research group at the University of Alberta, both students and staff, for their comments and suggestions. This research was funded in part by a contract from the Canadian Human Rights Commission and, rather indirectly, by the Social Sciences and Humanities Research Council Research Grant 410-96-0349.

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VI. NEUROLINGUISTICS

HISTORY OF AN IDEA:
4-BRAINMIND EVOLUTION OF LANGUAGE MODEL

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1. UCLA Training and Early Fieldwork.[1] In my linguistics training at ucla during the early heyday of Chomskyanism, I never questioned the way origins theories were presented. The whimsically named 'Bow-Wow', 'Ding-Dong', 'Yo-He-Ho' and other speculations were each somehow important, yet none was sufficient to show how the uniqueness of human speech came about. What I didn't notice at the time was a huge gap: there was no evolutionary theory of language to match what was going on in other major fields such as biology because Chomskyans wanted linguistics to be autonomous.

I'm sorry to say that I was probably the most unprepared linguistic fieldworker who ever went to the field as I spent four years on the Northern Cheyenne Reservation in the early '70s as a linguist and administrator for a federal bilingual/bicultural education program. Imagine learning the Chomskyan linguistics with its notion of autonomous syntax and then going out and working with real people instead of making up data and drawing trees! I came back from that experience a very different person and linguist.

2. UC Berkeley. Returning to training after fieldwork experience, I met three people at Berkeley whose influence would be crucial to my next directions. My wife, Marilyn Silva, who encouraged my burgeoning different view of the world; Syd Lamb, who gave me an underground paper by an anthropologist studying telepathy (Greist 1976) that would change what kinds of things I thought were publishable; and a Cheyenne-Chickasaw man with a law degree from Harvard, James Sákéj Youngblood Henderson, who with his wife, Marie Battiste, adopted me as their friend and gave me entre into intellectual Indian America.

3. The Cheyenne Tower of Babel Teaching. Something Sákéj told me early on kept resounding in my head over the years, because it implied that linguistics was paying attention to only one part of language—that of the waking and working state—and ignoring something else that was vital to a diachronic understanding and to meaning.

> *Long ago, humans and spirits and animals and plants all communicated in the same way. Then something happened. After that, we had to talk to each other with human speech. But we retained the 'Old Language' for dreams, and for communicating with spirits and animals and plants.*

Since such uses of language—though language in decidedly alternative modes—happen in alternative states of consciousness such as dreams and prayer, I thought, perhaps, that would be a good distinction to begin with when looking at language in a larger, evolutionary perspective.

4. BRAINWAVE BIOFEEDBACK RESEARCH. Positing different levels of consciousness for language led me to brainwave research going on in biofeedback labs, since some alternative states of consciousness have distinctive brainwave signatures, usually involving a decrease of beta (fast-wave processing) and a corresponding increase in slower processing speeds, such as alpha or theta.

Here are the major accepted biowave levels used in biofeedback (higher numbers indicate more information being processed, in cycles per second):

a. Delta—0.1–3 cps—bodily processing, esp. in dreams
b. Theta—4–7 cps—emotional processing
c. Alpha—8–12 cps—background hearing and vision
d. Beta[2]—12–40+ cps—foregrounded concentration of vision, hearing

It is important to remember that we are usually, even while in awake/alert state, in some mixture or another of these levels at any given time—we are seldom if ever just in one alone. It is the mixture of levels that is most important.

5. FOUR FUNCTIONAL BRAINS OUT OF THREE PHYSICAL. At the same time, I learned that—unique among at least land animals on Earth (cetacean data is in no way complete)—two functionally different hemispheres have developed out of one cortex, the cortex that we share with other mammals. Underneath the cortical cap of the brain, we have two other brains that we share functionally with other creatures of Earth. They are, in evolutionary order:

a. R-Complex (Reptilian Brain)—physical/motor orientation to the world, unconscious gesture
b. Limbic System—processes emotions
c. Cortex—undifferentiated at birth, lateralizes between 2–13 yrs. Afterwards:
    1. Right hemisphere—spatial sense, background hearing and vision; some say grammatical morphemes

2. Left hemisphere—elaborated vocabulary and syntax, fine motor movement, focused vision and concentrated hearing, literacy; some say lexical morphemes

6. INTEGRATING THE SPACETIME OF THE BRAIN. Further, one hemisphere seems to specialize, in a biological process called *hemispheric lateralization* that takes about a decade to accomplish, in a way that typically results in more of the faster speeds happening in the left and more of the slower speeds happening in the right (much of the time for most people).

Certain similarities of patterning began suggesting themselves to me regarding the Space of the brain and its Timing. For instance:

- Emotions are processed in the limbic system, and are processed in the theta range (especially for simpler emotions such as anger, as opposed to word-mediated ones such as hatred).
- Evolutionarily earlier seems to include slower brainwave rhythms, and the two things we have that we don't see in the rest of nature—a lateralized left hemisphere and a lot of high-speed beta functioning—seem together to be the most evolutionarily recent.
- Developmentally interesting facts: babies predominate in slower waves and begin producing faster ones with age and experience; sustained formal thinking is developmentally impossible until about the onset of puberty, which is about when lateralization is complete.

These considerations led me to wonder whether there was some relationship that could be posited between the four functional brains and the four brainwave speeds—not in any absolutist sense that no other brainwave speed than that one can go on in a functional brain, but that each brain has its own neutral or 'home' speed of a particular character. In this very general sense, the oldest brain is home to delta speed; the limbic system is home to theta; and R & L Hemispheres are home to alpha and beta, respectively.

7. PIAGET'S LEVELS OF THINKING. I published the above speculations in the late '70s, but it wasn't until the early '90s while teaching a course on Piaget that I realized the importance of his theory to my own ideas. His theory of human cognitive development shows four levels of thinking that unfold over time, with adults operating in various mixes:

a. Sensori-Motor—operating physically on the world; 0–2 yrs
b. Pre-Operational—rising above emotions with rationality; 2–7 yrs
c. Concrete Operational—social ways of thinking (often denigrated as 'magical thinking': 7–12 yrs
d. Formal Operational—formal thinking; 12+ yrs, if ever

The similarities between physical brainwave rhythm levels and these cognitive levels leapt out at me, including how closely the numbers connected with brainwave cps resembled the numbers connected with childhood years in Piaget's scheme.

8. MORE INTEGRATING. I then began to wonder whether the patterned similiarity I saw between brain timing and modes of thinking might be more than coincidental, since Piaget's levels could be describing the kind of thinking that goes on in the different rhythms in the brain—as with the link between theta and the limbic system and Piaget's pre-operational stage of human development, where kids are learning to cognitively get on top of their emotions.

Mapping Piaget's scheme onto my brainmind model of similarities allowed for the possibility that each functional brain has its own qualitatively different kind of thinking going on at a particular rhythm or speed. Again, this is not absolute, since I posit each brain taking in slower, more analog input and putting out faster, more digital output.

In thinking of how the body communicates with itself, it dawned on me that each level and kind of thinking could be associated with a qualitatively different kind of languaging and grammar as well.

9. FOUR RELATIONSHIP MODES OF LANGUAGING. And once I started going in that direction, the following natural modes of language relationships suggested themselves:

a. Bodily intimate—as with twins and other multiple births, and to a lesser extent the parent/child bond and otherwise long intimate experience. This is a physical mode having to do with gestures and facial expressions, the bodily contribution to the total meaning taken in mostly visually (kinesthetically when touching).
b. Intimate—with extensive shared experience, where the nuanced emotional tunes of *how* one says something is often more consequential to the relationship than what one actually says. This mode can be characterized as consisting of very holistic utterances, highly abbreviated and telegraphic (including interjections, tone of voice, etc., often ignored in language study) when compared to formal standards
c. Social—friends/acquantainces level, morphology and simple syntax, idioms. (In this mode, for instance, no morpheme indicating 'alcohol' is present when someone talks about 'falling off the wagon', and yet the force of the whole phrase means that). Meanings are less holistic than in the Intimate mode, yet less analytic than in the Formal mode.
d. Formal—how strangers talk with each other in the same language (academe), full of elaborated vocabulary and syntax. This mode is mostly learned (the way we're socialized into Cash English and

BIOWAVE LEVELS	BRAIN STRUCTURES	PIAGETIAN STAGES	LANGUAGE REL-MODES	L-R-MODE EXAMPLES	ORIGINS SPECULATIONS
beta: 13+ cps* β	Left hemisphere (after lateralization)—Literacy, much visual processing (i.e., focused vs. background)	Formal operations stage. 12+ years, if ever	Formal, elaborated talk, as with strangers	'I don't know' lo-hi-mid tune optional shrug	none
alpha: 8–13 cps α	Right hemisphere (after lateralization)—Much auditory processing (i.e., background vs. focused)	Concrete operations stage. 7–12 years	Social talk with friends and acquaintances, formulas, idioms	'I dunno' lo-hi-mid tune optional shrug	Bow-wow Ding-dong Yoo-hoo
beta: 4–8 cps θ	limbic system—Simple emotions	Pre-operational stage. 2–7 years	Intimate talk, interjections, spoken tunes	'M-m-m' lo-hi-mid tune optional shrug	Pooh-pooh! Yo-he-ho Spmg
beta: 0.1–4 cps Δ	Reptilian brain—body orientation, gestures, expressions, gut feelings	Sensori-motor stage. 0–2 years	Twins, Mult's (Clones?), Parent/Child (physical rapport)	shrug (optionally with hands open and up)	Gesture Grooming

*Recent information from Neurofeedback Training posits a beta-1 level at 13-20 cps and a beta-2 at 20-40+ cps., saying, 'We consider these brainwave frequency patterns as indices of levels of consciousness'.

Figure 1. Brainwave processing model of similarities

Standard English in schooling), not naturally acquired like the other levels.[3]

Looking at it this way, two considerations struck me:

Much of linguistics seems to be based on formal stranger-talk, something hardly possible before the rise of cities 6000 years ago. Right there the usual synchronic view of language would not seem to lead to evolutionary understanding.

But perhaps there could be other languages spoken and understood by each evolutionary functional brain, not just the most recent. And they would be qualitatively different, with qualitatively different kinds of grammar (more holistic and analog), and backed up by qualitatively different kinds of thinking, a la Piaget.

Perhaps we could see these different levels at work today in different languaging modes—some verbal, some non-verbal; some geared toward production of forms and some toward the comprehension of intended meaning:

Examples of Utterances in Different Languaging Modes ('I don't know')

a. Bodily: shrug, possibly with open hands out
b. Intimate: 'M-m-m' (voiced tune with low-hi-mid intonation; (a) optional)
c. Social: 'I dunno'. (usually low-hi-mid intonation; (a) optional)
d. Formal: 'I do not know'. (usually low-hi-mid-low intonation; (a) optional)

Looking at it this way, it can be seen that animals communicate in social mode but not formal mode since the characterization is the same for animal utterances as for human idioms—in essence: the intended meaning comes from the entire utterance, not from compositional parts. And they often communicate the purer emotions (excitement, anger, etc.) in ways understandable to us, often using facial expressions and gestures and postures that we find quite meaningful.

The closer our relationship with other beings, and the more experience we have shared with them, the less is needed of formal ways of speaking and the more of nuanced understanding is shared with the merest of tonal or gestural change; indeed, speaking formally generally puts one at a distinct disadvantage in social and intimate relationships. Coming from a meaning-first approach, languaging becomes more compositional and elaborated the less people know each other.

10. Applying 4-BrainMind Model to Evolution of Language. The last piece of the puzzle fell into place after being on the Evolution of Language List on the Web a while, when I realized that the profession of linguistics has no accepted evolutionary theory of language—though lots of speculations to be sure, which I categorize below according to the categories motivated above.

a. **Gestural/Visual (Delta)**

- *Hand and body gestures.* We had hands for millions of years before we had speech, and neuro-research has shown that speech and sign process in the same places in the brain. Gordon Hewes and others have eloquently argued this gestural view as important to understanding the evolution of language. These gestures are produced kinesthetically but received mostly visually.
- *Grooming.* Others have proposed grooming as important: that talk came out of intimate touching and cooing by our hominid ancestors, which would argue for a relationship more intimate than that of strangers to each other as being basic to understanding the evolution of language.
- *A kinesthetic base for language.* An insight from Native America could be useful here, which contrasts a Blackfoot/English bilingual individual's perception of an important difference between the two languages: 'When I say the simplest thing in English, like "I'm going to ride a horse", I get images coming up in my mind. When I say the same thing in Blackfoot, however, no images come up—just feelings of movement'.

  His observation illustrates how Native American languages and thinking may be based more on the kinesthetic mode (delta, similar to ASL[4]) than the visual (beta) mode more common to Western languages, and that what is often dismissed in Native American translations into English as speaking metaphorically[5] may actually be the nuances of kinesthetic thinking, as well as their more habitual focus on similarities rather than differences.[6]

b. **Emotional (Theta)**

- *Pooh-pooh!* The 'Pooh-Pooh' speculation is that speech arose from spontaneous emotional interjections, such as not believing someone or a rock falling on your foot. Note that interjections are not inflected or otherwise modifiable in the way words in higher levels of language can be (**I ow*, **you ow*, **we ow*, etc.).
- *Song.* 'Song' itself has been speculated to be the precursor of speaking: that song minus music is speech (less minus for tone languages), and that song minus speech is music—that song seems to have preceded speech, rather than being what you get when you put together two separately evolved abilities.[7] Leanne Hinton, in *Flutes of fire*, observes that song unites while speech divides, and gives us a compelling description of attending in northwestern Mexico a meeting of women from diverse locals and languages who could not talk to each other well, but all joined together on many levels in song.
- *Yo-He-Ho.* The 'Yo-He-Ho' speculation, on the other hand, claims that speech arose from hominids singing while working, to keep the emotional spirits up and to synchronize in tempo with each other, so therefore perhaps this one actually partakes of all of these categories.

c. **Aural/Social (Alpha)**

- *Bow-Wow* and *Ding-Dong.* The 'Bow-wow' speculation claims that speech began by imitating the sounds of other animate creatures, while the 'Ding-

Dong' adds the importance of imitating the sounds of so-called inanimate objects as well.

- *Yoo-Hoo.* In the 'Yoo-Hoo' speculation, on the other hand, (and let us not forget how well Yoo-Hoo goes with Ding-Dongs!) human speech arose out of and was elaborated from simple calling to each other.

d. Formal (Beta)

- none—no other creatures sustain beta processing.

10.1. INTEGRATION. Taking an independently motivated set of levels of functional brains, brain timing, levels of thinking and levels of languaging according to similaries of patterning, and then using them to order pre-existing speculations, each of which was necessary but not sufficient, now yields an evolutionary flow to an otherwise random listing found in many texts.

It also allows for the possibility, in essence, that each of these levels is a timespace language dealing with different nuances of the world all at once—and the multimodal blending of them all at a given time is what we often call 'consciousness'.

11. LANGUAGE. Each level of similarities, which I usually choose to label Beta, Alpha, Theta, Delta, becomes in effect a different diachronic language with its own unique grammar, as well as a way of thinking and of relating to other human beings and the rest of Nature. The levels are in dynamic interaction with each other, except in writing (which uses only the most recent). Let's examine what this model says about the notion of 'language' in a way which might be useful to our profession.

11.1. COMPLEMENTARY SYNTHESIZING. The following oppositions are often taken as binarily dichotomous by linguists, and other times in a complementary way, even though we are trained that these pairs of terms are both true at the same time:

- *Production and/or Comprehension.* Some of the above language modes we associate more with a hearer understanding the speaker (from posture, expressions, gestures, tone of voice, and hearing phonemes), and some we associate more with a speaker's production of forms (phonetics). We know that kids and chimps understand more than they produce.
- *Form and/or Meaning.* While we laud the balancing of these, we too often use 'meaning' in a purely utilitarian way, to check whether two forms are 'same' or 'different'. Lost from a form-primary practice is the sense of the whole which we encounter on a daily lived basis—a dynamic meaning-flow[8] between participants in a relationship with each other (other than that of strangers), who pay little attention to the actual forms except in breakdown of that meaning-flow.
- *Speaker and/or Hearer.* Years ago I came across some research on perception[9] which concluded that in face-to-face communication, 55% of the impact is bodily, 38% is emotional tone of voice, and 7% words—which fits the similar-

ities of this model beautifully, with the more 'unconscious' levels being more powerful than the words to perceived meaning (however much we might wish to quibble with the percentages themselves). The very focus of the word 'impact' is on the hearer, and therefore more about understanding the meaning than about production properties of linguistic forms per se by the speaker.

- *Verbal and/or Non-Verbal.* Production relies more on the verbal and comprehension relies as much or more on the non-verbal for congruence and multimodal accuracy of the speaker's meaning.
- *Synchronic and/or Diachronic.* We know that any use of language unconsciously derives from both simultaneously.

11.2. UNBALANCING THE BALANCE. Yet, in practice, a bias toward form and the verbal, speaker-production side of the equation is very congenial to a current synchronic view of language which is quite workable for most linguists—that *language* is a convenient shorthand for *human language* just like *can't* is for *can not*, and language is what sets us apart from the animals since no other animals have systems with the properties of language.

This prevailing synchronic conception of language is good for most purposes, but a lousy tool for investigating the evolution of language, since animals cannot qualify as having 'language' unless they have the properties of an elaborated human language at the stranger-talk level, which we may have only begun with the advent of cities. It is biased toward adult production, even though we know animals and children comprehend far more language than they can produce.

11.3. REBALANCING. Obviously, a diachronic conception of language will work better for evolutionary concerns, one which looks at similarities between us and animals as well instead of exclusively differences—one more about the meaning side of the equation, the way we as hearers understand what someone else is saying by interpreting their posture, gestures, facial expressions, tones of voice and their modulations against what you know against a backdrop of experience in a relationship with this individual, and which at the same time allows for how Kanzi the bonobo chimp and our own pets share most of an evolutionary history with us, which explains our rapport with them and their intelligence on so many levels except the formal one.

A truly balanced view of language, synchronic and diachronic at the same time, would allow us to stop saying such silly statements as 'Language is what sets humans apart from other animals'[10], and an evolutionary model such as this helps us make sense of how closely Kanzi and other bonobos resemble our own two year-olds in language abilities and bring some structure to what is often called 'proto-language' of toddlers and 'non-language' of Kanzi and our pets.

12. CONCLUSION. Using indigenous wisdom as a starting point for this historical journey, with its teaching distinction between a synchronic and diachronic view of speech and the Old Language in non-rational states; finding ways of distinguishing the non-rational states; finding that they have more to do with comprehension than production; finding distinct levels of thinking which are similar to brainwave levels and seem to favor specific parts of our evolutionary brains—these findings led to motivating different modes of language, each with its own kind of grammar, which then allowed putting separate origins speculations into an evolutionary flow matching the evolution of our brain.

This presentation is not a formal scientific theory, nor a hypothesis—it's a model of similarities, of cognitive patterning, brought in as a possible spotlight into a very murky corner of the profession of linguistics.[11]

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[1] A different version of this paper was presented in April, 1998, at the Portland Spring Meeting of the Society for the Anthropology of Consciousness—a group similar in many ways to this one.

[2] A recent move in biofeedback has added another beta-sublevel such that beta-1 is from 12–20 cps, and beta-2 is 21+ ; if anything, for my model, this helps by showing the part of beta that is acquired before lateralization is complete and the part that is learned once there is a functionally separate high-speed container for abstract thinking. Neurofeedback Training trainers state, 'we consider these brainwave frequency patterns as indices of levels of consciousness' (from brochure).

[3] Lamb, Makkai, Halliday, Givon and others have motivated a more idiomatic social mode of talk.

[4] For instance, in Cheyenne, the word for 'rattlesnake', /$e?$e-novote/, contains as its first and most important part a morpheme otherwise used for 'duck', /$e?$e/, and the second part means 'going down in a hole'. What can be so important in similarity that these two animals share this morpheme? Would anyone ever use 'duck' as a metaphor for 'rattlesnake' or vice versa? The mystery is solved when you think kinesthetically, as I've been told, about how similar a duck and rattlesnake are in their movements and sounds as they are going away from you, and that's what the first morpheme means. Native American languages are full of examples of this, extending even to the word for 'God' in two dissimilar Plains languages, Cheyenne and Lakhota—*Maˀhe-oˀo* in Cheyenne contains two morphemes, one meaning 'large' and one denoting animacy or spirit; Lakhota *wakan tanka* similarly contains two morphemes meaning 'large' and 'spirit'. The mystery is again solved when we see that Plains Indian Sign Language for 'God' contains three morphemes: 'large', 'medicine,' and 'up'.

[5] Amethyst First Rider, Blackfoot, made the bold claim at a 1992 Dialoge Between Western and Indigenous Scientists: 'When we're speaking our own Native languages, no matter what it sounds like when translated into English, we're NOT using metaphor'.

[6] That is, although some have claimed 'metaphor' as universal to all human language, a larger view which recognizes a place for indigenous knowing might say that 'categorizing' is universal, and that while Western languages use metaphor as a major form of categorizing, many Native American languages do not. For instance, *iyeska* in Lakhota means either half-breed, translator, or shaman in English, for which we get different pictures. But in Lakhota, the particular alternative is a function of the context—whether you are speaking of ancestry, two languages, or a sacred context: in each, the individual is transacting between two different realms in a certain way.

[7] Song is animate within an animate worldview. Jack Norton, a Hupa anthropologist teaching at CSU Humboldt, a few years ago told the Society for the Anthropology of Consciousness about an incident where he was practicing songs for an upcoming ceremony, and this unfamiliar song intruded into his consciousness; he would push it away with his own praticing, then it would come back and run around in his head. After the ceremony he looked up an elder and sang the song to him, and he was told it belonged to someone in the early 1900s and it hadn't been sung since then: 'I guess it was getting lonely for someone to sing it', he was told. Similarly, last year Leroy Little Bear told me that a particular Blackfoot elder living in the Canadian Rockies had just died: 'He knew over 200, maybe 250, songs for raising tobacco'. 'Tobacco?' I asked. 'I didn't know you could raise tobacco here; I thought that was only in the southeast—Virginia, Kentucky, like that!' He calmly turned to me and said, 'That's why it takes over 200 songs!'

[8] Continental philosophers such as Heidegger have argued passionately for a 'ready-to-hand' flowingness of our experience as well as the more scientific 'present-at-hand' mode. Physicist David Bohm also argued for a flowing 'rheomode' of reality in Wholeness and the Implicate Order.

[9] One of many sources for this is O'Conner and Seymour's *Introducing Neuro-Linguistic Programming*: 'Research shows that in a presentation before a group of people, 55 per cent of the impact is determined by your body language—posture, gestures, and eye contact—38 per cent by your tone of voice, and only 7 per cent by the content of your presentation (Mehrabian[, A]. and Ferris[, R.]. 1967. Inference of attitudes from non-verbal communication in two channels. *The journal of counselling psychology* 31: 248–52.)' (O'Conner & Seymour 1990:17)

[10] i.e., if 'language'='human language', why does 'Human language is what sets humans apart from other animals since no other animals have systems with the properties of human language' sound so tautological?

[11] My thanks as well to Syd Lamb for an extremely helpful critique of an earlier version, and as usual to Matthew Bronson and Marilyn Silva for helping shape my ideas for most of the past two decades.

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THE NEURAL SUBSTRATE OF PERCEPTUAL AND RECALLED IMAGES AS COGNITIVE TOPICS

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In her PhD thesis, *Talk of times past: On the interaction of cognitive systems in conversation* (1991), Cynthia Ford Meyer seeks to understand cognitive topic, which she holds is the cognitive source of the patterns expressed as conversational topics in a dialogue. She uses as data the recorded, recalled, personal experiences of her grandparents' early life on the Oklahoma frontier. Within the framework of Sydney Lamb's relational network, Meyer defines cognitive topic as an activated location in the cognitive network system that guides an interlocuter in the production and interpretation of conversation. It designates the place in the network at which new information is to be added or from which it is to be retrieved, depending on the speaker's role in the conversation (ibid:115–16).

Conversational topics exist as domains of knowledge which are stored in the cognitive system as a complex of nections. Each nection, in this complex of nections, has other connections along which topic activation may move under certain circumstances. Information is in the connectivity of connections organized hierarchically in networks as lines and nodes. Local organization of information in the cognitive system contributes to the accessibility of information which appears as conversational topic in the surface dialogue.

Meyer uses the results of an analysis of the surface-dialogue topic of her grandmother's twice-told recalled memory of a spiritual experience in her youth at her mother's grave as evidence that the information of the experience in her grandmother's cognitive system is not a linguistic memory. According to Meyer, had it been stored in the linguistic system, the wording would have been the same in the second account. Also, verbalization of the experience would not have been as problematic as is shown in the following example, which is marked by many pauses. In the first telling:

> Do you remember the time that you were saved?
>
> > Ooooh—yes
>
> Where was it?
>
> > I dont't know it seem likes kinda peculiar (pause)
> > that it happened that away (pause)

> But uh (pause) (ibid:225)

And in the second telling which took place some ten years later:

> I remember you tellin one time bout when you were saved
> what uh do you remember about that?
> Oh I just felt like uh (pause)
> I needed somethin (comin)
> and I went to (pause) out to where momma was buried'n (pause)
> kneeled down in prayer
> I thought (there) where her head was (pause)
> but I don't know whether (pause) it was her head or her feet
> 'N I(pause) (ibid:226).

Comparison of the twice-told narrative of the experience contains the same time, place and action sequence but differs in the specification of details. This is further evidence that the memory of the recalled experience is a non-linguistic perceptual memory of a sensory experience which is connected to, but at the same time is outside the area of the linguistic system (ibid:233). The explanation for this is that there is a discrepancy between the semiological structure and the lexico-grammatical structure. Though all the information concerning the spiritual experience exists in the cognitive system at one time, because the process of verbalization is linear and sequential, it requires that the experience be expressed in a sequence of utterances which in turn involve a sequence of smaller pieces. In terms of network conception, this process requires the division of a selected but undivided portion of memory into smaller configurations of concepts that are manageable for linguistic expression. In other words, the process of expressing the experience to another person involves a selection of concepts followed by their translation into linguistic expression.

In this paper, the original perception and memory of a recalled experience are not viewed as resulting from the breakdown of information for telling followed by a separation of the obtained portions into smaller configurations of concepts for expression as discrete participants and events. Instead, both the original experience and the recalled memory are considered as issuing from a neural substrate within a large network in which perception and memory of experience can be defined as patterns of neuronal activity that provide the nervous system with structured information or representations which can become images. Information concerning the neural substrate provided in the paper is based on Antonio Damasio's 1994 book, *Descartes' error: Emotion, reason, and the human brain.*

PURPOSE. The paper shows that cognitive topics correspond to the perceptual/conceptual neural substrate of recalled images.

RECALLED IMAGES—NEURAL SUBSTRATE: When stimulated, sensory nerve terminals send signals to any of five possible entry points in the brain which are called primary sensory cortices (networks) of vision, hearing, somatic (body) sensations, taste and olfaction. Each primary sensory region is a collection of several areas and is characterized by cross signalling among the aggregate areas in each primary assembly. These interlocked sectors in primary sensory networks are the basis for topologically organized representations which are the source of mental images. Direct experience forms perceptual images, whereas a remembrance of things past forms recalled images. Since the brain holds and retrieves knowledge of recalled images in a spatially segregated rather than an integrated manner, both the attention to and active retention or working memory of a recalled image are necessary so that the component of knowledge that is retrieved as a recalled image can be manipulated in time. Damasio hypothesizes that recalled images are stored as dispositional representations which exist as patterns of neuron activity in small ensembles of neurons called convergence zones located throughout the higher-order association cortices in the occipital, temporal, parietal and frontal regions as well as in the basal ganglia and limbic structures (Damasio 1994:102). The neural patterns of non-topographically organized, acquired dispositional representations construct topographically organized representations of recalled images by firing at certain rates, for a certain amount of time in the primary sensory cortices where the firing patterns corresponding to the original perceptual representations once occurred (cf. Lamb 1999). This results in an interpretation which is a newly reconstructed version of the original perception. Several dispositional representations are needed to fire back in synchrony to get a recalled image. As one's age and experience change, versions of a recalled image change as well.

Although the primary sensory cortices and the topographically organized representations they form are necessary for images to occur in consciousness, they must be interconnected to an organism's many dispositional representations in varied somatosensory cortices (Damasio 1994:242). The neural ensemble or convergence zone, which is the neural substrate for building dispositional representations all over the brain in cortical regions as well as in subcortical nuclei, is at third a set of neural structures which is neither the one which supports the image of an object nor the somatosensory representations associated with it but is reciprocally interconnected with both. Convergence zones which are located in prefrontal cortices represent the classification of one's life experiences. Prefrontal networks establish dispositional representations (concepts) for certain combinations of things and events in one's individual experience according to the personal relevance of those things and events. These convergence zones have the capacity to acquire a three-way link among signals concerned with particular types of situations characterizing an individual's unique experiences, the different types of body state which have been associated with the situations and the emotions and feelings of the body states. Damasio (ibid:103) postulates, that within about a hundred milliseconds after the convergence zones for a recalled memory have fired back, one would see patterns of activity that would have some relation to an original experience.

COGNITIVE-TOPIC/RECALLED-IMAGE HYPOTHESIS. The neural device which has been described for the construction of recalled images is non-linguistic and so does not require language. I postulate that the neural ensembles of convergences zones in the prefrontal cortex correspond to the configurations of sequenced concepts or cognitive topics with which the linguistic system interfaces and also, that they are the master convergence areas for the cognitive topics. This hypothesis is supported by the results of Meyer's analysis of the comparison of the two tellings by her grandmother of her spiritual experience when she was a young girl. The comparison shows that her grandmother had difficulty in verbalizing each of the two tellings, which occurred some ten years apart and some fifty years after her experience. Meyer noted that the overall structure of each telling, the factual details, the patterning of the verbal semantics, tense and aspect reveal differences in the two tellings. She concludes that this shows that the tellings express a single memory which is stored non-linguistically in sensory perceptual modalities, and that more information is stored in connection with an experience than is expressed in a single telling. An extrapolation of this conclusion would be that this single memory is a cognitive topic. In the terms of neuroscience, the cognitive topic corresponds to a recalled image with its neural substrate, and each telling corresponds to an interpretation of the original experience.

DISCUSSION. Viewing the storage of a recalled image within a neural substrate confirms Meyer's tenet that recalled memory is nonverbal (ibid:243). In addition it shows explicitly that the single recalled memory is not a reproduction of the original experience because the potential neural pattern of a recalled image as a dispositional representation is not fixed and can be rearranged so that other object and spatial properties or characteristics of the original experience can be encoded. This process results in the construction of a new interpretation of the original experience.

The results of Meyer's comparison analysis also brings into focus that her grandmother had great difficulty in verbalizing the emotional impact of her spiritual experience. In the first telling, her grandmother herself says she can't characterize her emotion:

> What'd you feel like?
> 　　Well—I don't know it just seem like that—
> 　　That's somethin you can't hardly tell isn't it? (Meyer 1991:226)

Whereas in the second telling, she indicates she had feelings:

> Oh I just felt like uh—
> I needed somethin (ibid:226)

According to Meyer one reason for the difficulty in translating the recalled memory into linguistic expression could be due to a conventional limitation in expressing feelings. An additional neuroscience explanation for the pauses and disfluencies in the telling would be to take into account the fifty-year lapse between the original experience and her grandmother's attempt to verbalize the recalled memory. Since the potential dispositional representations of the experience which are stored in convergence-zone ensembles, had not been frequently activated over fifty years, their reactivation by the firing of neuron patterns would probably take more time and would reconstruct a less vivid and a less accurate interpretation of the original experience in its re-telling. The first telling is probably her grandmother's attempt to bring the spiritual experience into focus and so, this is why she only gives facts about the scene at which the experience took place. This hypothesis is supported by the fact that more details as well as a verbal expression of a feeling as in the example, 'Everything looked so good to me', are added to the narrative in the second telling some ten years later (ibid).

CONCLUSION. Cynthia Meyer's chapter on the cognitive storage of a twice-told recalled memory of her grandmother's spiritual experience has offered a rich base for the study of the neural substrate of recalled images and the plausibility of their correspondence with cognitive topics. A neuroscience definition of a recalled image describes the process of its production as one of reconstruction in which neuron activity focuses on an interpretation of the neural patterns that had once existed as experience. An examination of the neural substrate of a recalled image has supplemented, and thus has led to a better understanding of the cognitive processes involved in the production of a recalled memory as described by Meyer.

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LOCAL AND DISTRIBUTED REPRESENTATION IN NETWORK MODELS OF LINGUISTIC AND CONCEPTUAL STRUCTURE

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One of the most essential properties of language seems also to be an easy one to take for granted, like the air we breathe, which we don't pay attention to and don't even see, even though we couldn't live for long without it. So also, we couldn't use language at all, not even for a moment, if we didn't have linguistic information at our disposal, the lexicon and grammar and so forth. Somehow that information must be represented in our brains. But how is it represented? And why is it that most linguists don't even bother to think about that question? I won't try to answer that second question.

As to the first one, there appear to be two basic methods of representing information—by means of symbols, and by means of a system of connections forming a network, and I believe that the latter is what the brain uses for language as well as for other kinds of information. The first method, symbolic representation, is what we use universally for information that is external to us—written symbols on pieces of paper, or on blackboards, printed symbolic representations in books. This is also the method used for representing information in computers. Some may suppose that the computer is an electronically implemented network system, but it too represents information symbolically. Symbols, like alphabetic characters and numerals, are represented in a binary code, and each bit of the binary code is a symbol, stored either electronically or magnetically. In a dynamic RAM, it is done with tiny capacitors in the silicon chip—at each location in the memory, one value is represented by a relatively large number of electrons, the other by a relatively much smaller number of electrons. On a magnetic disk, each position has a magnetic field that is oriented either in one direction or in the opposite direction. Why did the engineers who first designed computers decide to do it this way? The alternative method of representing information may never have occurred to them as a possibility. What they designed was the electronic equivalent of what was familiar to them, the practice of writing and reading symbols on paper.

The other method of representing information is by means of a system of connections. Such a system, which may be called a network, is made up of interconnected nodes. The connections, which can be called lines, carry activation from one node to others. A node generally has multiple lines coming into it, and it has a threshold or threshold function, according to which it sends activation out along its outgoing lines in variable amounts as a function of the amount of activation being received from its incoming lines. Connectivity may involve differing strengths of connections as well as the difference between a positive connection and a negative or inhibitory one.

Many neuroscientists believe that this is the method used by the brain itself, and of course it is well known that the brain is indeed a network of neurons and that at the microscopic level it does work this way. Each neuron has a cell body, implementing a node, together with fibers, which implement the lines of the abstract model, and it is indeed the case that the cell body of a neuron sends out varying amounts of activation as a function of the amount of incoming activation. On the other hand, there are those who believe that the brain somehow uses its network of neurons to read and write and store internal symbols—I believe they think in this way because it is the only way of representing information they are familiar with. We are not familiar with what our brains actually are doing to represent information, only with the kinds of information that are external to our brains.

This paper looks at two basic methods by which information can be represented in a network: LOCAL REPRESENTATION and DISTRIBUTED REPRESENTATION. A local representation of an item of information uses a single node while a distributed representation uses several or many nodes (sometimes called a VECTOR). The local representation theory can also be called the SINGLE-CELL theory or the SINGLE-NODE theory. An often used example is the GRANDMOTHER NODE, a single node for representing a person's grandmother in that person's information system. Of course such a node would represent the person's grandmother only by virtue of its incoming lines which would have to come from properties of the grandmother, such as visual properties of her appearance, and so forth. There seems to be a prevailing view among neural network modelers that the only reasonable models are those which use distributed representations in preference to local representations (cf. Churchland & Sejnowski 1992; Anderson 1995). Local coding is rejected as neurologically unrealistic and cognitively unworkable or computationally inefficient.

RELATIONAL NETWORKS. Now, connectionism had already been in existence in linguistics for some time, in the form of RELATIONAL NETWORK THEORY, when cognitive psychologists began to take an interest in network models, and it is among this new breed of network modelers that the issue of local vs. distributed representation has arisen. Those few of them who have even heard of relational networks have been less than enthusiastic about them, perhaps because of an impression that they use local coding and are therefore neurologically implausible. But I intend to show that such an appraisal can only emerge from a superficial glance at relational networks. From the relational network point of view, it is not a question of *either* local *or* distributed representation, since the relational network uses *both* local *and* distributed representation. It does have grandmother nodes, but they exist alongside,

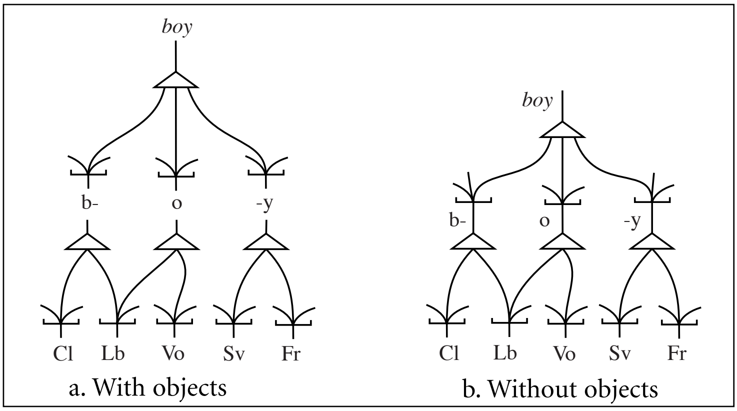

Figure 1. Relationships with and without objects.

and connected to, distributed representations. One might well ask, why do we need local representation if we have distributed representation? To have both would seem to be adding redundancy to the already rejected implausibility and inefficiency. To this question I intend to offer some answers.

The relational network model was arrived at by analyzing the relationships among linguistic units. Starting with the traditional assumption that a lexical item (likewise morpheme, phoneme) is a unit of some kind, an object or symbol or combination of symbols, I analyzed the relationships among them. But after they are thus plotted, as relationships among structural elements (phonemes, morphemes, lexemes, etc.), those elements can be removed from the resulting diagrams with no loss of information, since whatever information they can be considered to represent is now represented in the depiction of its relationships (Lamb 1970). Upon removal of the symbols from the structure, the result is a network of relationships—not symbols and relationships, just relationships, represented as interconnections among nodes (Figure 1).

This analysis ends up with ^{M}*boy* as a point within a network and therefore a local network representation. It may appear at first glance, then, that this type of network uses local *rather than* distributed representation, but that node for the morpheme is connected to nodes for higher-level phonological units, which in turn are connected to nodes representing phonological features. Thus each morpheme, for example *boy*, has a multi-level distributed representation, as can be seen in Figure 1b. The activation of the matrix of phonological features, at the bottom layer of the distributed representation, gives speakers of English their conscious impression of the expression side of the morpheme. The distributed representation of a morpheme also extends upwards from the morpheme level to nodes for lexemes and concepts (Figure 2). What we have, then, is *both* local *and* distributed representa-

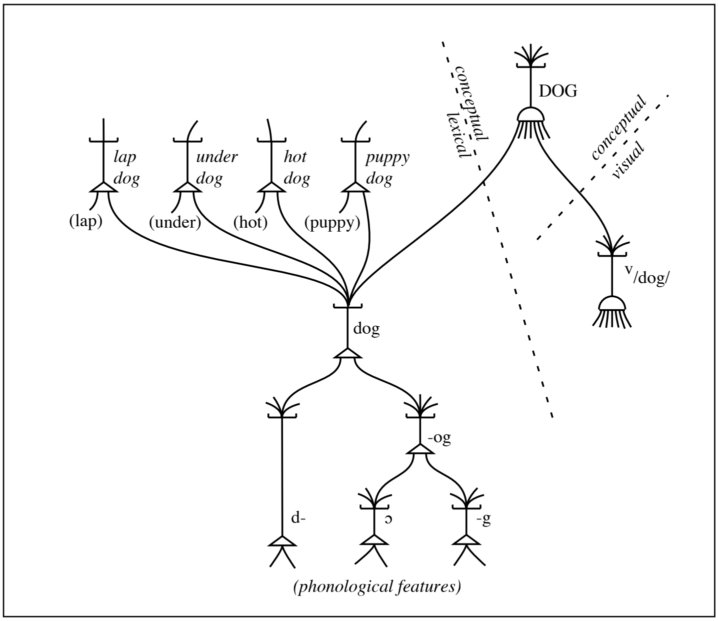

Figure 2. Distributed representation of a morpheme.

tion of morphemes, likewise of lexemes and phonemes. It is a matter of *both-and* rather than *either-or*.

ARGUMENTS AGAINST LOCAL REPRESENTATION. A good summary of the arguments against local representation has been presented by Churchland and Sejnowski (1992:163):

> Essentially, the criticism of local coding squares off in three places.... (1) Local coding is underdetermined even by its best evidence; that is, the available evidence is perfectly consistent with vector coding; (2) recognizing new things and producing motor responses to new things are problematic on the local-coding theory, much less so on the vector-coding theory; (3) the patterns recognized visually by a human in a lifetime vastly outstrip the number of sensory processing neurons in the entire human nervous system.

The first of these arguments is not really an argument against local coding at all. It only states that some of the best evidence in favor of local coding fails to *rule out* vector coding, since it can also be provided with an interpretation in a vector-coding model. An example is the finding that in a monkey's visual cortex, there is a single neuron that responds when the monkey sees another monkey looking directly at him, independently of whether that other monkey is standing straight up or bending over or in some other body position. While such evidence, of which there is a great deal, supports the local coding theory, it can also be interpreted using a vector coding theory and therefore does not rule out the latter.

The other two arguments are more important. In order to see how relational network theory responds to such attacks it will be necessary first to understand something about the learning process; and we also need to consider two further ways in which network representations can differ from one another, besides the difference between local and distributed representation. First, let us consider the distinction between arbitrary and functional distributed representations.

Arbitrary and Functional Representation. In ARBITRARY distributed representations, the elements of the vector have no functional values of their own. An example is provided by the binary representations of the ASCII code, a code used for representing alphabetical and other characters in a computer. Although we can find some non-arbitrary features in this code—for example, the sequence of binary values follows alphabetic sequence—this code is in principle arbitrary. On the other hand, a matrix of phonological features in the distributed representation of a morpheme is a FUNCTIONAL distributed representation, since each of the elements has an identifiable functional value as a phonological feature. Much of the discussion of distributed representations seems to assume arbitrary distributed representations or not even to consider this distinction important. In fact, part of the mystique of distributed representations seems to come from the fact that computer programs using them manage to come up with the ability to do what they are being trained to do, eventually arriving at weights for the connections which work, such that the nodes of the 'hidden' layer have arrived at what may for all we know be an arbitrary code.

Concepts, like phonemes and morphemes, can also be represented by functional distributed representations. A node for a conceptual category has connections to/from a large number of nodes representing its properties, both to/from other conceptual nodes and to/from other subsystems. For example, concepts for categories of visible objects need connections to nodes in the visual area, those for audible objects to/from auditory nodes, and so forth. Taking the concept ^{C}CAT, for example, we have visual connections comprising what a cat looks like, auditory connections for the 'meow' and other sounds made by a cat, tactile connections for what a cat feels like to the touch; as well as connections to other concepts representing information about cats in the information system of the person in whose system these connections have been formed. Figure 3 shows some high-level nodes with direct connections to the central ^{C}CAT node, each of which connects to many others not shown, forming in all a multi-level distributed representation comprising perhaps hundreds or thousands of nodes. And so a person's knowledge of cats is represented in the system by a subnetwork which includes a visual subnetwork

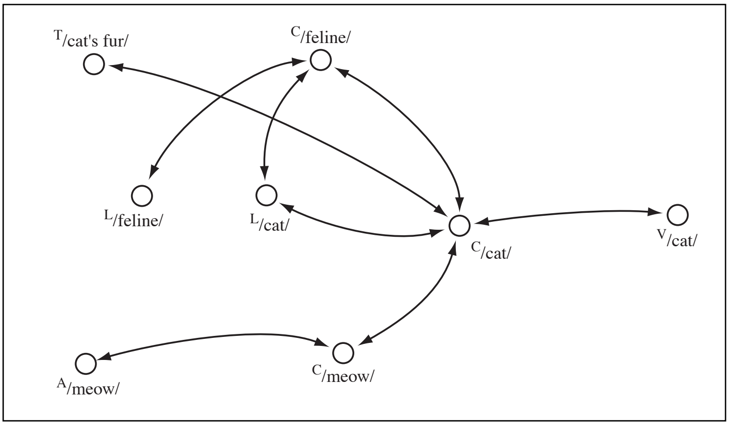

Figure 3. Part of the distributed representation of a conceptual category. [^{A} - auditory, ^{C} - Conceptual (either concrete or abstract), ^{L} - Lexical, ^{T} - Tactile, ^{V} - visual.]

for the visual features, an auditory network for the 'meow', and so forth, constituting a multi-level distributed representation; all 'held together' by a central coordinating node, a local representation, to which we can give the label '^{C}cat'. That multi-level distributed representation is a functional one, since each of its elements represents an actual conceptual or perceptual property.

This is a general property of a system which uses functional distributed representations and multiple levels: *Every element of a distributed representation is also providing a local representation at its own level for the property it encodes*. What is a local representation at its own level is part of a functional distributed representation for higher levels. Again we see that distributed and local representation complement each other rather than competing as alternatives.

Learning in Relational Networks. According to the learning hypothesis of relational network theory, learning is mainly a bottom-up process which consists of the building and strengthening of connections and adjusting of thresholds (Lamb 1997, 1999a, 1999b). But we need not suppose that new connections actually get built. The alternative hypothesis is that the initial (innate, pre-learning) state of the network includes abundant latent connections, from each node to many (but not to all) nodes of other levels, which start out very weak, in effect with near-zero strength. A latent connection gets strengthened when it is active while the node to which it is connected has its threshold satisfied by virtue of also receiving activation from other connections (Lamb 1999b). In other words, success is rewarded: a connection is successful when it contributes to the satisfaction of a threshold of a node, and its reward is that it gets strengthened.

We must also hypothesize that each node has a threshold function such that a greater amount of incoming activation leads to a greater amount of threshold satisfaction, causing the node to send varying degrees of activation out to other nodes: strong activation if the threshold is strongly satisfied, weak if only slightly satisfied, none if the incoming activation doesn't reach the threshold at all. It follows that a part of the learning process has to consist of adjustments in the threshold so that the node will be neither too easily satisfied nor too stringent in its demands.

The process of learning a concept is a matter of recruiting a node which can integrate information from perceptual as well as other conceptual locations. In the initial stages of learning a concept there may be only a few such connections, representing the properties present in awareness at the time of first learning. The process of strengthening connections applies both in the initial recruitment of a node and to its later fine-tuning to adjust to new information coming in after the initial recruitment. Such fine-tuning operations are of two kinds: (1) adding 'new' connections, for properties of new exemplars that were not present at the time of initial learning of the concept; and (2) strengthening already established connections, for properties repeatedly associated with the concept. After a sufficient amount of experience, those properties that are most frequently associated with a concept will have acquired great strength, while those only occasionally present will have acquired relatively weak strength.

The conceptual node resulting from this learning process will represent a *category* of objects and will be satisfied by any member of the category defined by its connections. It will have learned to be satisfied by a *sufficient amount* of activation *from among* all of the nodes representing its properties, and it will automatically exhibit prototype effects, since it will respond more strongly to prototypical exemplars than to peripheral ones. Why? Because the prototypical ones are those with the strongest and the most connections from the properties associated with the category. A casually encountered exemplar of the category, say a particular cat one happens to see walking across a lawn, is temporarily represented as specific distributed representation of the nodes activated by it, together with the one or more category nodes which coordinate them (e.g., the ^{C}CAT node). Such a distributed representation necessarily consists of just a subset of the nodes connected to the category node—for example, it includes a visual node or nodes for the color of that particular cat but not those for other cats.

Now, an exemplar which receives sufficient attention and/or sufficiently repeated activation, say your own pet cat, will be remembered, by means of a specific node which becomes dedicated to it, a new local representation. Its individual properties are represented as connections to a subset of the nodes representing the properties of the category.

COARSE AND FINE REPRESENTATION.These observations bring up a further distinction between two varieties of representation: COARSE and FINE. A node for a coarse representation responds to a range of values rather than to a specific value. It is known that normal people have a neuron for green color that responds to a range of wave-lengths, more strongly to those in the middle of the range. Higher-level nodes with connections from multiple such coarsely tuned nodes can provide a fine (more specific) representation of color.

We have seen also that any conceptual category node provides a coarse representation. For example, the *cat* node will be activated by any of a very large variety of distributed representations, for cats of different colors and sizes and with different lengths of fur. Different cats among them will share some of the nodes of their distributed representations and differ with respect to others. They will all share only the central coordinating node for the conceptual category, that to which we can assign the label ^{C}CAT.

THE REBUTTAL. We now have the groundwork for responding to the arguments against local representation. The first of those leveled by Churchland and Sejnowsky, which is really just the observation that some of the evidence in favor of local representation does not actually rule out distributed representation, we have already dealt with.

The second is that 'recognizing new things and producing motor responses to new things are problematic on the local-coding theory'. In the context of visual perception, the argument is that if everything that one learns to recognize visually requires its own node, how can one recognize new things? What about grandmother in a new outfit, or riding a bicycle if the person has never before seen her riding a bicycle? Now, whatever strength this argument may seem to have rests upon the assumption that any such locally coded node, like a grandmother node, is finely coded. But we have seen that higher-level nodes can be coarsely coded, including conceptual nodes, which therefore respond to any of a wide variety of combinations of features. It *cannot happen* in a network which learns in the way described above, that every pattern recognized visually would get its own local representation—far from it. A node will be recruited for a specific function, say for grandmother, only when there is a definite need, as registered in the system through repeated activation. In other words, *we learn only what we learn*, not everything we experience; and nodes get recruited only for what we learn.

But even a grandmother node is coarsely coded, since it is connected to many other nodes constituting a distributed representation and occupying several other regions—visual, auditory (the sound of her voice), lexical, as well as to other conceptual subareas. Therefore, it recognizes grandmother when she is wearing different clothing, when only her face is seen, when she is in different positions and activities, or seen from different angles, or when only a picture of her is seen – even, perhaps with less activation, when a picture of her at an earlier age is seen for the first time.

Another objection to local representation (besides the three I cited from Churchland and Sejnowski) is that it seems not to provide a means of accounting for the graceful degradation of mental systems under conditions of slight impairment. Can the relational network respond to such objections? One argument asserts that hundreds of neurons die every day in the normal human brain, but we don't suddenly lose the ability to recognize our grandmother. This objection can be answered in two ways: First, in accordance with the general biological principle 'use it or lose it', it is likely that in such natural death of neurons it is the latent nodes, those not yet recruited for a function, which die – except under injurious situations like strokes, and then *we do indeed get sharply impaired and highly specific losses of function*. Second, we do not demand that there be only one neuron corresponding to one node of a relational network. On the contrary, it is likely that a node corresponds to *many* neurons, particularly if it is a frequently used one.

Now, the third objection of Churchland and Sejnowski is that 'the patterns recognized visually by a human in a lifetime vastly outstrip the number of sensory processing neurons in the entire human nervous system'. Well, we have already seen that in relational network theory every pattern recognized does *not* require its own local node—only the patterns which come to be learned as units. And so we can immediately reject this argument as stated, but we can also rephrase it into a more cogent one: Perhaps the number of items *learned* in a lifetime outstrip the number of available neurons. To examine this possibility we would have to estimate how many distinct items of information we learn as units in a lifetime; but how could we arrive at a reliable figure?

It is better to take something that we have some control of, so let us take some measurable part of linguistic structure. Consider Wernicke's area, the portion of the left temporal lobe in which we have our phonological representations. We can make a rough estimate of how many neurons are there by measuring the cortical surface of this area and multiplying by a reasonable estimate of the number of neurons per square centimeter of cortical surface. Wernicke's area, in a typical person, includes the posterior portion of the superior temporal gyrus, extending also into the Sylvian fissure and the superior temporal sulcus, perhaps also into the middle temporal gyrus (Figure 4). The horizontal extent, as might be measured along the top of the superior temporal gyrus, might be about three cm in the typical individual, and the extent in the orthogonal direction might include about two cm of the temporal plane (in the Sylvian fissure), plus three cm for the superior temporal gyrus and the superior temporal sulcus. For these rough measures we get a surface area of three cm by five cm, or fifteen square cm. Now, a reasonable fairly conservative estimate of the density of neurons is one hundred thousand per square mm of cortical surface, or ten million per square cm. And so we get

$$15 \text{ cm}^2 \text{ x } 10^7 \text{ neurons/cm}^2 = 15\text{x}10^7 \text{ neurons}$$

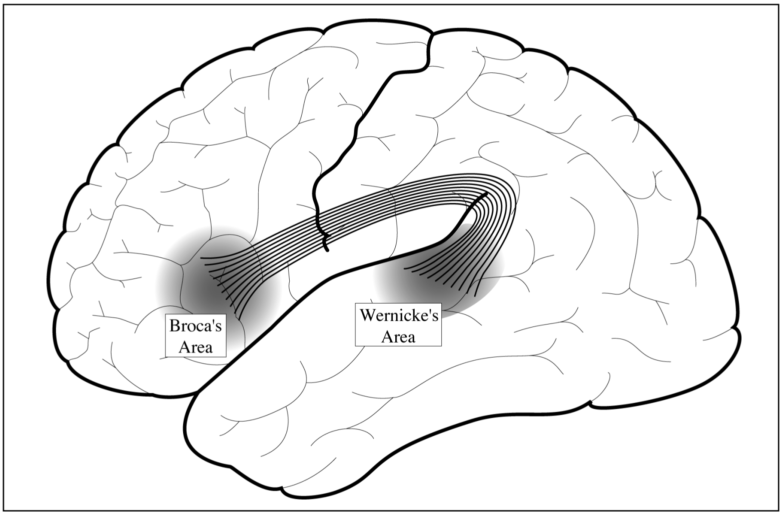

Figure 4. Wernicke's Area, Broca's Area and the Arcuate Fasciculus.

or one hundred fifty million neurons. But we do not suppose that a node of a relational network corresponds to one neuron of cortex, far from it. It is more likely that a node of a relational network is implemented as a cortical column, consisting of about one hundred neurons. So we divide one hundred fifty million by one hundred, to get one-and-a-half million relational network nodes (a.k.a. nections) in Wernicke's area, in a typical individual.

Now, Wernicke's area needs enough nodes to represent all the phonons, phonemes, and larger phonological units that might become known by a person—syllables, phonological words, fixed phonological phrases—in as many different languages as a person is likely to be able to learn to speak with a high degree of fluency. A very liberal estimate would be fifty thousand per language. If we multiply by twenty for a phenomenal polyglot with twenty fluent languages, we get a requirement of one million. And so the quantities match up pretty well—we have a requirement for one million nodes, and we have one-and-a-half million nodes available—and this is for a very liberal estimate of a person with phenomenal linguistic abilities. On the other hand, such a polyglot probably has a larger Wernicke's area than the average person. Actually, I have *over*estimated the requirement, since I added together all of the phonological forms in all of the languages, disregarding that many of them overlap from one language to another and can therefore share the same nodes—forms like those for *taxi*, *coffee*, and numerous terms of Latin origin.

ARGUMENTS FAVORING LOCAL REPRESENTATION. The preceding section defends the local representation against arguments that have been levelled against it. It remains to argue further for some distinct *advantages* of local representation and corresponding disadvantages of trying to use distributed representation without local representation.

First, the current impression that we have in our conscious awareness of a scene or a situation or a person results from a widely distributed representation of many nodes, and it is the lower-level nodes whose activation gives us our conscious experience while the higher-level ones function to provide coordination of those lower-level nodes, so that they are kept active in concert. Without such higher-level local representations, how could the system provide for the coordinated activation of the low-level nodes of the distributed representations?

The second argument may be introduced with this question: How does the system transmit information from one sub-system (region) to another? It's not enough to say 'by means of connections'. Just what is being transmitted over these connections? For example, how is the unique identification of a concept passed to the specific corresponding lexical representation?

This problem has a completely direct and simple solution in a network with local representation: Each different item to be distinguished—for example, each phoneme, each morpheme, each lexeme, each concept—has its own local node, in its own location, with its own connections representing its relationships. Therefore the transmission of identification from one subsystem to another simply means *the activation of the unique connection(s) from the local node in the one subsystem to one or more local nodes of the other*. (There may be multiple nodes in the other subsystem, as in the case of a lexeme connecting to multiple concepts.)

This is the localist solution to the puzzle posed by the above question. It is the first of three conceivable answers: (1) Have separate (unique) connections, a separate line for each; (2) transmit some kind of code for the distributed representation; (3) transmit symbols. But answer (3) requires some kind of coding of the symbols for transmission along connecting lines—for example a bundle of eight lines could transmit any ASCII character, a bundle ('bus') of 32 lines any computer word of a 32-bit computer, so it is really a version of answer (2). Therefore, we have two hypotheses of how inter-regional communication is accomplished: (1) unique connections, and (2) coded vector representations transmitted over shared connections.

The second one, to me, raises more questions than it answers. What kind of code is transmitted over the shared connections? The simplest possibility would be the same vector that constitutes the distributed representation. But if the system uses functional distributed representations, this approach won't work, since it is altogether unlikely that the functional representation for one modality (for example, a vector of phonological units) would coincide with that for another (a vector of conceptual properties). The alternative is arbitrary distributed representations. But this possibility is hardly more attractive. For here too it is unlikely that the same arbitrary vector would be arrived at within two separate modalities by any reasonable learning process. Therefore, it would be necessary either to have some kind of central coding agency, to code the vector for one region into some kind of common code for transmission to other regions and then to decode that vector at the other end to fit the vector of the destination region, and this would look a lot like an internal homunculus; or else one end of each inter-regional pathway would have to somehow learn the code of the other end and do some kind of translation locally—a possibility which some people may consider worthy of being entertained, but I am not among them.

Now, there is a clear consequence of the difference between these two hypotheses; each constitutes a prediction about an important property of brain structure. Answer (2) would require far fewer connecting lines than answer (1), as the same bundle of lines could be used for transmitting different information, in much the same way as a 32-bit computer bus can transmit billions of different possible codes. We can therefore identify an empirical test for each fiber bundle which interconnects two cortical regions: How many fibers are in the bundle? To take a specific case, how many fibers are in the arcuate fasciculus, the most important fiber bundle for language? Here I accept the usual view, that this fascicle connects Wernicke's area (phonological recognition) to Broca's area (phonological production), as indicated in Figure 4 above. Under any reasonable version of solution (2) only a small number of fibers is needed, say a few hundred, or at most a few thousand if abundant redundancy is built in. But for solution (1), again with redundancy, and allowing for the capacity of people to become multilingual, several hundreds of thousands of fibers are necessary, perhaps over a million. Here, then, we have our prediction. The relational network theory predicts that the number of fibers in the arcuate fasciculus is in the hundreds of thousands, while the arbitrary code theory predicts at most a few thousand. What is the answer? It seems that, as of now, we must await further work in neuroanatomy; and so the prediction really is a prediction. The latest word I have been able to find on the topic is that of Seldon (1985:300): 'The physically most extensive and macroscopically most obvious projection from the sensory language region is the arcuate fasciculus, which leads to area 44 (FCB or Broca's area). In spite of its importance, little is known about the fasciculus, such as the number of axons it contains…'. I can only point out for now that since this bundle is 'macroscopically most obvious', it seems more likely that it contains a very large rather than a very small number of axons.

The localist position, in the relational network context, can also put forth a quantitative argument in its favor: Far from requiring too many nodes (as alleged in some arguments against local representation), a system with local representation requires far fewer nodes than a system without local representation (cf. Sullivan 1975). Consider the 'dictionary entry': Various items of information of different kinds (morphological, phonological, conceptual) need to be connected to each lexeme. In the localist system this requirement is met very simply by having just one node for each lexeme, since the other information for it is no more than the information already represented within other regions in locations to which this lexical node is connected. But in a system without local representation, each lexical entry would require *far more than* one node within its own region. For how else can it specify precisely what phonological information and information of other kinds are associated with it? The problem of connecting the identification of the lexeme to the information about it reduces to a version of the question considered above about interregional relationships. And we see that although the distributed representation theory would require fewer fibers in the fiber bundles connecting lexical information to other regions, it requires very extensive duplication of information in the lexicon. This is not a minor matter if we consider the quantities needed for a lexicon of over a hundred thousand 'entries' for each of the several different languages of a multilingual person. So we can turn the tables: It is the *non-localist* position that would run out of neurons in the case of the multilingual person, rather than the localist model.

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CENTRAL APHASIA AND THE MYTH OF G: TOWARD A GRAMMAR-FREE LINGUISTICS

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The term 'grammar' means various things in various contexts.[1] In the present paper the term refers to any actual or potential model of language knowledge, or proper subpart thereof, that claims to represent the basis for both the receptive and expressive skills of a language user as a single set of bidirectional input/output relations. Although we find many variants of this basic assumption (cf. Straight 1992), typically this 'abstract code' consists of a set or several interconnected sets of 'rules' that define the membership of the set of possible sentences, or possible words, or possible sounds that 'constitute' a particular language (cf. Straight 1983).

The linguist's syntactic, morphological, lexical, and phonological rules or processes or propositions or procedures or constraints or interconnected nodes then become the linguist's characterization of the individual language user's language knowledge. By means of this knowledge, the user supposedly 'gains access to', or establishes connections between and among the set of possible linguistic 'representations' that serve as the input and output (and perhaps also the intermediate stages) of the processes of language comprehension and production. This knowledge also serves as the putative basis for arriving at judgments about such things as grammaticality, ambiguity, similarity, and synonymy.

This set-theoretic, representation-focused approach to the definition of language, and what Sydney Lamb would undoubtedly call its 'introjection' into models of the human mind (Lamb 1999), has dominated linguistics for several (innumerable?) generations. In its place, I believe, linguistics needs to adopt a thoroughgoing information-processing approach to the definition of language (see Straight 1979 for further comments on the history and repercussions of this approach). In the present paper, after providing a bit of historical detail, I describe and defend a particular example of such an approach (cf. Straight 1993 for a broader treatment of this issue) and discuss a specific item of neuropsychological evidence for this particular model.

1. The Myth of G. Most theories of language, in whole or in part, adhere to a fundamentally fallacious premise regarding what enables language users to engage in acts of construing and saying. This false premise holds that language users possess knowledge of a non- or ambi-directional set of rules, processes, propositions,

procedures, or constraints that define the set of objects that constitute a specific language, regardless of whether those objects are considered as perceptual or motoric in nature. The reigning linguistic paradigm embraces this premise so firmly that few linguists even state it in their published work and even fewer subject it to challenge, or favor it with defense. The clearest expositions of the premise appear in introductory treatments of the field of linguistics. For example, on page 197 of his best-selling 1994 book, *The language instinct*, Steven Pinker explains that 'Grammar itself', which he has spent much of the preceding 196 pages expounding for the reader,

> is a mere code or protocol, a static database specifying what kinds of sounds correspond to what kinds of meanings in a particular language. It is not a recipe or program for speaking and understanding. Speaking and understanding share a grammatical database (the language we speak is the same as the language we understand)… (Pinker 1994:197)

Another example, from Ray Jackendoff's book, *Patterns in the mind: Language and human nature*, written in the same year (1994), for a more academic but still basically beginners audience, explains up front that

> …in order for us to speak and understand novel sentences, we have to store in our heads not just the words of our language but also the patterns of sentences possible in our language. These patterns, in turn, describe not just patterns of *words* but also patterns of *patterns*. Linguists refer to these patterns as the *rules* of language stored in memory; they refer to the complete collection of rules as the *mental grammar* of the language, or *grammar* for short. (Jackendoff 1994:14, emphasis in original)

Despite clear evidence that the processes and products of language reception differ markedly from the processes and products of language expression, both, according to Pinker and Jackendoff, derive from a common knowledge base. We can call this flawed view 'The Myth of Grammar', or Myth of G for short. Lest you conclude that I am mounting yet another attack on Chomskyan linguistics, in which the term 'grammar' plays an unprecedentedly prominent role, let me add that even non-Chomskyan linguists adopt this same insidious direction-neutral view of language knowledge.

For example, in his otherwise wonderful 1996 book *Language and communicative practices*, William Hanks cites Saussure's (1916) discussion of 'the circuit of *parole*', or the speaking circuit, in defense of the claim that 'Producing and understanding speech are inverse processes . . . , but they utilize exactly the same code' (Hanks 1996:28). Indeed, we could say that the alleged 'mutual implication' of signifiers and signifieds, symbolized by the double-headed arrows that appear in the

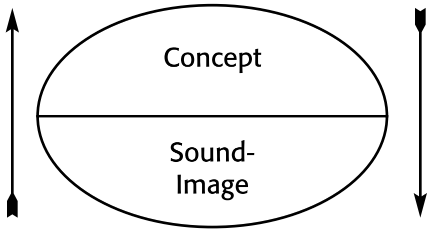

Figure 1. The nature of the linguistic sign (after Saussure 1956:66).

classic depiction of Saussure's model of the linguistic sign (see Figure 1), demonstrates the long-standing hold that the Myth of G has had on linguistic scholars.

I will return shortly to Saussure, and to Hanks's use of Saussure's definition of *langue*, but let me mention now that further support for the Myth of G has derived from the related myth that Saussure's *langue/parole* distinction prefigures Chomsky's *competence/performance* distinction, in which a direction-neutral generative grammar constitutes the linguist's model of *competence*, which is posited as the abstract knowledge upon which language users base their *performance*, bifurcated into comprehension and production.

Regular attendees of meetings of the Linguistic Association of Canada and the United States will realize that Sydney Lamb and other previous contributors to LACUS conferences have attacked and rejected many aspects of the Myth of G, as do many other linguists of many stripes, but I present an alternative that I believe roots out the lingering remnants of this myth more thoroughly than any previous contributor or scholar has attempted.

2. Dialectical-Processual Linguistics: Language Knowledge Without a Grammar. By rejecting the Myth of G, linguistics can make the processes of language reception and expression the paired foci of investigation. If we focus first on processes instead of structures, we can call one possible non-G paradigm 'processual', and if we emphasize the ways in which input processes and output processes interact in (even the most idealized) language performance to result in never-ending partial resolutions of the opposing tendencies between them, we can call this non-G paradigm 'dialectical'. The 'structures' of language become, in the DIALECTICAL-PROCESSUAL, or 'D-P' model, by-products of the processes whereby people analyze language input and of the processes whereby people synthesize language output.

Of course we find commonalities between language events viewed as examples of cog0nitive interpretation via sensory and perceptual integration and contextual inference, and the same events viewed as examples of intentional expression via higher-level utterance planning and motor coordination, but rather than attributing these commonalities to an overarching body of abstract knowledge that mediates between them, we can see them as generalizations immanent in the system but not present, at any 'level of representation', no matter how unconscious, in the minds of the language users (cf. Straight 1980b). In the last section of this paper I explain one of the ways in which interaction between receptive and expressive processes depends upon processual knowledge that resides in neither, but even here we find the need to posit two sets of interconnections, one mediating between reception and expression and the other mediating between expression and reception. In the D-P model, all processual components have their dialectical counterparts across the perception-action divide.

Historically savvy linguists may realize that the D-P paradigm revives Ferdinand de Saussure's original neuropsychological definition of the distinction between *langue* and *parole* (Saussure 1916). The former, Saussure insisted, is the stable, shared aspect of language ability, the receptive skills that enable people to construe what they hear or read in very much the same way, while *parole* is the volatile, variable aspect of language ability, the expressive skills that enable people to say things in the idiosyncratic and innovative ways they do.

After having dissected the *le circuit de parole* (speaking circuit) into its physical, physiological, and psychological portions, and these into active/executive and passive/receptive portions, Saussure notes that in defining *langue*—which he singles out as the sole, proper object of linguistic investigation, 'le côté exécutif reste hors de cause' ('the executive side [of the circuit] remains beyond our consideration').[2] So much for *parole*. He then says of *langue* that 'On peut la localiser dans la portion déterminée du circuit [de parole] où une image auditive vient s'associer à un concept' ('We can localize it in the limited portion of the speaking circuit where an auditory image comes to be associated with a concept') (Saussure 1916:31).

In the work I cited previously, William Hanks admits that 'Saussure's powerful rhetoric suggests a neat division between [*langue* and *parole*]', but Hanks insists that 'in fact the line is anything but clean' (1996:28). Hanks does this by ignoring the receptive-versus-expressive distinction in favor of the equation of *langue* with something like competence and of *parole* with something like performance:

> …A speaker's ability to enter into the circle depends upon knowledge of *langue*… We can see in all this that whatever else it does, *parole* instantiates *langue*. Since linguists, like other people, can perceive *langue* only through its manifestation in *parole*, the two faces of language are practically interwoven, even if they are in principle distinct. (ibid.)

Hanks here misinterprets Saussure. Saussure's insistence on the primacy of *langue* depended not upon his belief that speakers could somehow deploy that 'limited portion of the speaking circuit where an auditory image comes to be associated with a concept' as the basis for acts of *parole*, but rather upon his belief that 'l'exécution n'est jamais faite par la masse; elle est toujours individuelle, et l'individu en est toujours le maître; nous l'appellerons la *parole*' ('execution is never done by the collectivity; it's always individual, and the individual is always its master; we'll call it *parole*')(Saussure 1916:29). Moreover, because of its individual nature, *parole* exhibits great heterogeneity across speakers and mutability within individual speakers, while *langue*, serving as it does to make all speaking intelligible to all members of the collectivity, must by its very nature exhibit a rather high degree of homogeneity and stability.

Given the centrality of the reception-based definition of *langue* in his Introduction, we might well wonder why Saussure didn't stick to this definition in his depiction of the nature of the linguistic sign in Part One of the *Cours*. Saussure does repeat his admonition that the 'image auditive' is not vocal, and he warns that the articulation-based concept of the phoneme should not be used to describe these 'sound-images', thereby correctly dismissing phoneme-recognition as a necessary condition for speech perception and debunking the motor theory of speech perception even before it was born (Straight 1980a). Disappointingly, however, all three of the figures depicting the relationship between sound-images and concepts contain both an upward-pointing and a downward-pointing arrow (see Figure 1).

This fact, along with later parts of the *Cours* in which Saussure violates his own admonition against mixing the executive with the receptive aspects of language, has long led linguists to downplay Saussure's neuropsychological, receptive-only definition of *langue* in favor of the usual non-directional theory of language as a system of direction-neutral signs.

It turns out that the editors of Saussure's great posthumous work did him a great disservice. Working from the original student notes on Saussure's lectures (later published in Engler 1967), Robert Godel showed in 1957—a fateful year in the history of linguistics—that in every case but one easily explicable exception, where the students have drawn this figure, contrary to the published book and all subsequent reproductions of this supposedly double-arrowed image of the linguistic sign, 'la figure revient, toujours flanquée de la flèche pointée vers le haut, dont Saussure, du reste, a eu soin d'expliquer la raison d'être' ('the figure reappears, always flanked by an arrow pointing up, for which Saussure, moreover, had taken care to explain the rationale', Godel 1957:238).

To the phrase 'Traduttore, traditore' ('Translator, traitor') we must now add 'Rédacteurs, saboteurs': The editors of what is perhaps the most influential linguistics book of the 20th century perhaps unwittingly but nonetheless effectively undermined Saussure's fundamentally anti-G position in favor of a position more in keeping with the then already long-standing and the now still-prevalent Myth of G.

As far as we can tell from his students' notes (Engler 1967), Saussure did not much develop his anti-G ideas beyond what I have noted above. Nonetheless, he does reveal some awareness of the aphasiological evidence for *langue* when he says that 'Elle [(la langue)] est si bien une chose distincte qu'un homme privé de l'usage de la parole conserve la langue, pourvu qu'il comprenne les signes vocaux qu'il entend' ('*Langue* is such a distinct thing that a man deprived of the use of speech retains *langue*, provided that he understands the vocal signs he hears', Saussure 1916:31). Given his limited attention to these issues, then, we must realize that the dialectical-processual model of language presented here may well go farther than Saussure would have in insisting upon a separation of receptive from expressive processes.

The dialectical-processual model does however temper this complete bifurcation by insisting, contrary to Saussure, that we cannot ignore 'the executive side' of language processing, because four generations worth of accumulated neuropsychological and other evidence since Saussure's lectures force us to recognize that the receptive and expressive aspects of language processing normally function together in actual events of both language comprehension and language production. Instead of adhering to Saussure's dictum that linguistics must focus exclusively on *langue*, the collectively represented, receptive aspect of language, the dialectical-processual model sees *langue* in constant, dynamic interaction with *parole*, the individually variable, expressive aspect of language, to the enormous benefit of both (cf. Straight 1982). Speakers use their interpretive abilities to monitor and premonitor their own output, thus opening up endless possibilities for repair, search, and selection. Listeners in turn use their formulative abilities to anticipate and rehearse the input they receive, thus providing powerful tools for inference and reanalysis, among other things.

On this processual view (see Figure 2), the well-established differences between the two 'directions' of language processing, and the ways in which interpretive and formulative processes interact with each other in all linguistic tasks, no longer stand as superficial distortions or complications of underlying 'direction-neutral' truths. Instead, they become the central objects of linguistic investigation, providing unparalleled insights into the irreducible dialectic between perception and action, recognition and recall, sensory analysis and motor coordination, and other posterior versus anterior dichotomies of the cerebral cortex (cf. Straight 1986). Examples of this dialectic, and of its power as an integrating precept for the study of language, exist in all domains of linguistics (cf. Straight 1971, 1976, 1980a, 1983, 1992).

3. Central Aphasia: Rare-Event Linguistics and the Myth of G. As an in-depth illustration of the value of a 'grammar-free' view of language, let me now turn to the field of aphasiology for an example of a rare language disorder that provides strong evidence for the fundamental dissociability of the auditory and the articulatory bases of listening and speaking, while at the same time suggesting how the two coexist and interact in normal language processing.

The example is a variety of aphasia included in or similar to 'conduction aphasia', a neurolinguistic disorder characterized by severe disruption of the ability to repeat heard speech, accompanied by difficulties in naming, but with relatively intact spontaneous speech comprehension and production and largely unimpaired

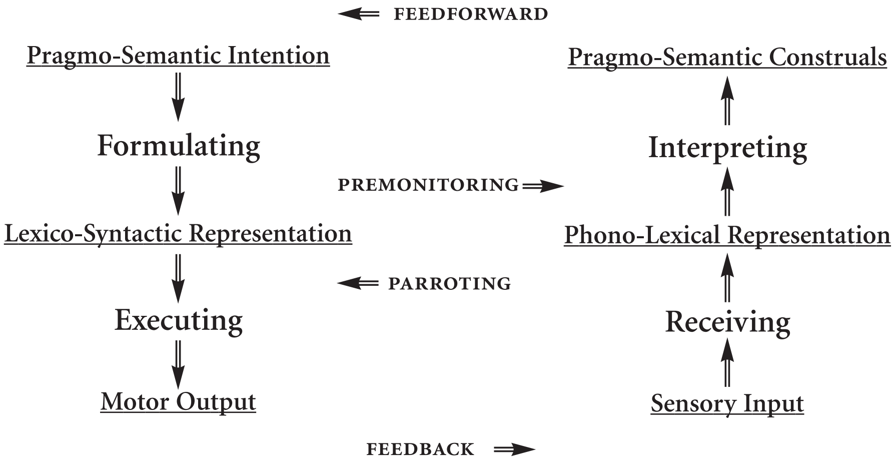
FEEDFORWARD
Pragmo-Semantic Intention
Formulating
Lexico-Syntactic Representation
Executing
Motor Output
Pragmo-Semantic Construals
Interpreting
Phono-Lexical Representation
Receiving
Sensory Input
PREMONITORING
PARROTING
FEEDBACK

Figure 2. The dialectical-processual model of language (modified from Straight 1982:124).

reading and writing. The following composite description of conduction aphasia derives from a large number of sources, which I will not attempt to separately credit for each part of the description (Ardila and Roselli 1990, Baum and Slatkovsky 1993, Damasio and Damasio 1980, 1983, Gandour et al. 1991, Goodglass 1992, 1993, Green and Howes 1977, Hegde 1994, Simmons 1990).

Neuroanatomists link conduction aphasia to damage to the anterior-to-posterior and posterior-to-anterior connections between Broca's area—the secondary association motor cortex implicated in the coordination of speech/language output, and Wernicke's area—the secondary association sensory cortex implicated in the linguistic-perceptual recognition of auditory and other sensory input. Because the most well-delineated band of nervous tissue that interconnects Broca's and Wernicke's areas is known as the arcuate fasciculus ('arc-shaped bundle'), conduction aphasia is sometimes called arcuate fasciculus aphasia. A fuller description of the neuroanatomical locus appears in Goodglass's 1993 book *Understanding Aphasia*:

> . . . The anatomical structure involved is the arcuate fasciculus, a bundle of fibers originating in the upper temporal lobe and following an arching path subcortically around the posterior end of the Sylvian fissure, passing deep to the supramarginal gyrus and then forward to the anterior speech zone. A large proportion of cases of conduction aphasia have lesions in the supramarginal gyrus, but many implicate the temporal lobe and the insula. (Goodglass 1993:94)

As with all aphasias, conduction aphasia comes in a confounding array of combinations with other aphasiological, neurological, and physical disorders. And even when we limit ourselves to the 'purest' cases, we find a complex array of degrees and variants. Nonetheless, the following generalizations hold true: Conduction aphasics do better repeating picturable nouns than more abstract nouns, nouns than other content words, content words than function words, individual words than phrases, idiomatic phrases than freely constructed phrases, phrases than sentences, familiar items than unfamiliar, and real speech than nonsense. Their spontaneous speech output is fluent, intelligible, appropriate, and grammatical, with normal prosody and no greater than normal quantities of semantic paraphasias (substitutions of meaningfully related words for presumed targets) or neologisms. They also exhibit occasional word-finding problems in naming tasks or spontaneous speech, and these problems occur more with content words than with function words. Their auditory comprehension is near-normal, but they have some difficulty with very complex sentences. Reading comprehension skills are typically normal. However, the speech of most conduction aphasics contains frequent phonemic errors. Moreover, unlike the usual 'fluent' (a.k.a. Wernicke's or sensory) aphasics, who have severe comprehension problems and show little awareness of the errors in their output, conduction aphasics show clear recognition of their own speech errors and make efforts to correct them, but with no more success than non-fluent (a.k.a. Broca's or motor) aphasics.

The aphasic syndrome I want to focus on here shares with run-of-the-mill conduction aphasia all of the symptoms just described except the occurrence of phonemic errors in repetition, and adds to that set the greater-than-normal occurrence of semantic paraphasias. I will discuss each of these differences in turn.

The symptoms of the typical conduction aphasic, who exhibits high error rates in the reproduction of heard speech but nonetheless often comes close phonetically, regardless of the type or meaning of the presumed target word, including even the occasional nonsense word, could easily result from a disruption rather than a severing of the interconnections between Wernicke's area and Broca's area. This disruption keeps the results of perceptual processing from being transduced into articulatory plans as accurately as they need to be in order to engage in faithful imitation of heard speech. However, to the extent that the patient exhibits any discernible tendency toward generalized but partial phonetic accuracy resulting in semantically unmotivated addition, deletion, and alteration of speech sounds in repetition tasks, conduction aphasia, characterized by such 'phonemic paraphasias', looks more like a jumbling than a severing of posterior-to-anterior connectivity. The most exacting terminologist would insist that an arcuate fasciculus patient who exhibits phonemic paraphasias has conduction *dys*phasia—*disruption* of repetition skill, rather than conduction *a*phasia—*loss* of repetition skill.

Crucially for the line of argument presented here, some aphasics do in fact exhibit complete loss of repetition skill rather than mere phonemic disruption in repetition. However, because this syndrome lacks the phonemic paraphasias in repetition that are currently held to be the primary diagnostic symptom of conduction aphasia (Kohn 1992:151), Michel and Andreewsky (1983) and Katz and Goodglass (1990), for terminological reasons that I will not go into here, have referred to it as 'deep dysphasia' (see Goodglass 1992:47–48; cf. Marshall et al. 1996). Instead of phonemic paraphasias, these aphasics produce semantic paraphasias in repetition tasks, substituting semantically related words, and they produce no more phonemic paraphasias in spontaneous speech than do normals (though they cannot readily correct such phonemic mistakes when they do occur). The patient repeats some words with little apparent difficulty, notably nouns referring to concrete, highly visualizable objects, while substituting semantically related words for words referring to less concrete or less visualizable objects or actions, and has the greatest difficulty repeating abstract nouns or verbs or other parts of speech, with function words least likely to be attempted at all, even though all of these troublesome items are present in normal proportions and used appropriately in the patient's spontaneous speech and understood without difficulty in speech the patient hears. The consistently semantic-paraphasic aphasic repeats nonsense words either as real words that sound like them or as real words that are semantically related to real words that sound like the nonsense words.

This non-phonemic form of conduction aphasia, which afflicts only a very small proportion of aphasic patients (less than one percent by my estimate from the various mixed and vague statistics I have been able to find), best meets the description of what Kurt Goldstein, a close observer of and acute empathizer with the lived experiences of his aphasic patients, referred to as 'central aphasia', characterized as an absence of what he and other neurologists before him had called 'inner speech':

> *Inner speech* belongs to the experiences which precede speaking, and is [also—HSS] elicited by the hearing of speech. According to the differences of opinion concerning the structure of these phenomena, inner speech has been considered differently. For those authors for whom the central phenomenon of speech is images, inner speech was silent speech, silent experiencing of images. Thus, Dejerine wrote: 'Notre langage intérieur s'effectue à l'aide des images auditives et motrices, et c'est l'union intime de ces deux espèces d'images qui constitue ce que l'on appelle la notion de mot'. ['Our inner speech comes into being by means of auditory and motor images, and it is the intimate union of these two types of image that constitutes what we call the notion of the word'. N.B., translation by HSS, no translation or citation is provided by Goldstein]…
>
> Wernicke… tried, on the basis of new experiences with aphasic patients, to define inner speech as a special association complex composed of motor and sensory images. He distinguished this complex from the motor and sensory processes in language and termed it "Wortbegriff" (concept of the

> word). Since that time, the problem of inner speech has usually been discussed in the form of "concept of the word." For normal speaking and understanding, the "Wortbegriff" must be intact… In a very interesting paper which did not find as much attention as it deserved, S. Freud spoke of a unitary phenomenon as the center of language, in which associations take place 'in a complex way which we can no longer understand'. Around this unitary phenomenon, the sensory and motor language phenomena are grouped.
>
> In contradiction to all these concepts, another concept of inner speech was emphasized by Storch ([1903: Der aphasische Symptomenkomplex, *Monnatsschrift für Psychiatrie und Neurologie* 13]) and myself ([1912: *Zentrale Aphasie, Neurologisches Zentralblatt* 12]). This concept denied that the 'Wortbegriff' is composed of images; it denied the significance of any such association-phenomena and considered the *Wortbegriff as an experience in principle different from sensory and motor phenomena*. Storch wrote [N.B., original has 'worte'; I have presumed to correct this typo but find it interesting in light of the German meaning of *Worte* 'words']: 'My inner experience knows only of concepts of words which sometimes are awakened by acoustic stimuli, sometimes precede phonetic innervations and come to the fore in discharge of motor phenomena'.* ['*Translated by this author', i.e., by Kurt Goldstein.] I myself characterized this central phenomenon of language in a similar way. It was scarcely possible at that state of our knowledge to describe it in very positive terms. More important was its usefulness in describing some clinical symptom complexes in a clearer way than before. (Goldstein 1948:92-94, emphasis in original)

Goldstein elaborated further on his judgment that the disruption of inner speech characterized one clearly discernible subtype of conduction aphasia:

> …That we are dealing with *a symptom complex which is not secondary to motor or sensory aphasia is evident from the fact that it can persist after the motor or sensory disturbances have disappeared and that it can occur without such disturbances at all* [emphasis added]. The symptom complex of so-called 'Leitungsaphasia' (conduction aphasia) now found a new and plausible interpretation by the assumption that we are dealing with the effect of damaged inner speech. I called the symptom complex *central aphasia* because inner speech seems to me to be the *central phenomenon of instrumentalities of speech. Inner speech is the totality of processes and experiences which occur when we are going to express our thoughts, etc., in external speech and when we perceive heard sounds as language*. Inner speech is, on the one hand, in relation to the 'non-language mental processes' (see p. 104), on the other hand to the external instrumentalities (external speech). The first relation finds its expression in the organization of inner speech according to the "inner speech-

> form," in the selection of definite word categories by a special language, in its syntactical forms and in its grammatical structure, in the adaptation of the particular speech to the general and special situation in which it takes place, its dependence upon the environment, the listener, etc. It has a definite character when we speak to somebody whom we can expect to have in general the same attitude towards the things we are talking about, who grasps the present situation and the means of communication in the same way as we do. Inner speech differs in a definite way when we speak to ourselves, when we read or write, when in writing we want to communicate with somebody we do not know, and even when we expect to have an individual reader of whom we cannot be sure whether he is in a condition to understand only hinted contexts. The words written may have different meaning for writer and reader; therefore, we have to express ourselves in another way than in speaking, if we want to be understood. (Goldstein 1948:94, emphasis in original except as noted)

This account of conduction aphasia, probably because it applies best to the rare subtype of this syndrome that meets Goldstein's semantic-versus-phonemic paraphasic description of 'central aphasia' (based on work Goldstein first published in 1911), is typically ignored or passed over quickly in the accounts that I have found so far, and it has yet to be refuted in the aphasiological literature as far as I have been able to tell. Note, however, that it meshes well with the dialectical-processual model of language presented above. It confirms the D-P model's prediction that the absence of auditory-to-articulatory transduction results in lack of rote imitation ability but retention of the ability to understand what has been said and then to reproduce that construed meaning employing one's own expressive capacities, with consequent mangling of all but the most concrete and visualizable items: Central aphasics can paraphrase but they can't parrot.

Goldstein's account also confirms, on the basis of empathic observation of his patients, that there are important symptoms of central aphasia beyond the loss of repetition skill that is caused by damage to the mechanism of auditory-to-articulatory transduction required for parroting. Specifically, damage to the contra-directional mechanism of articulatory-to-auditory transduction results in loss of the premonitoring abilities that are essential to the internal dialogue route whereby normal language users can monitor the formulated but not yet motorically executed products of their own expressive language processes. By virtue of such premonitoring, normal speakers employ their own interpretive language processes to that 'inner speech' to arrive at inferences, perceived ambiguities, metalinguistic judgments, and other mental constructs not present in the thought that gave rise to the monitored forms.

Turning now to the etiology of central aphasia, we can begin by noting that most aphasic syndromes exhibit an array of lesion sites to frustrate the most ardent neuroanatomical localizer, and that this holds true for conduction aphasia as well: The locus of the observable cortical damage seldom matches up well with the presumed arcuate-fasciculus target. Goldstein makes parallel but somewhat more reassuring observations:

> Our knowledge concerning the *anatomic lesion underlying central aphasia* is poor. It was Wernicke who first assumed that the part of the brain located between the 'sensory and motor speech centers' is paramount for the construction of the "Wortbegriff" (concept of words) and who considered accordingly 'conduction aphasia' as effect [*sic*] of a lesion in the region of the Insula Reili. There was much discussion about this and opposition to Wernicke's theory. He assumed particularly a destruction of association fibers connecting the sensory and motor speech areas as anatomic basis.
>
> I considered the theory as, in principle, correct, but from my general point of view was not inclined to assume a disruption of a simple pathway as basis of a psychologic defect. Repetition is not at all such a simple performance as Wernicke presupposed (see p. 70 [on which Goldstein observes that repetition can be either mindless parroting or deliberate repeating of understood speech—HSS]). If we want to bring the disturbance of repetition into relation with some anatomic defect, we cannot assume a defect of a simple fiber connection but dysfunction of a cortical apparatus. This is still more valid concerning the other symptoms which occur in these cases. (Goldstein 1948:239–40, emphasis in original)

Goldstein has made an extremely important point here, one that most writers on 'disconnection' syndromes often neglect: We haven't said much when we say that the arcuate fasciculus or any other cortical structure 'connects' one part of the brain to another. We must not allow ourselves to accept uncritically an insidious variant of the Myth of G wherein Wernicke's area or Broca's area, or both, somehow have access to a shared direction-neutral representation of the respective products of the perceptual processing of linguistic input and the products of the formulation of linguistic output, a representation equally 'recognizable' to both as the basis either for interpretive processing of internally-produced 'input' (would-be-but-not-quite output) or for the articulatory reproduction of externally-derived input (actual linguistically interpreted sensory input). To avoid the pernicious Myth of G we have to hypothesize that the arcuate fasciculus, and probably also the supramarginal gyrus that curves around the lateral fissure between the temporal and frontal lobes, along with other cortical structures that interconnect the temporal and frontal lobes, together perform the neuropsychological functions that are disrupted or absent in the conduction aphasic.

In this case, the dialectical-processual model of language immediately tells us what this function is (see Figure 2). The anterior-to-posterior, 'premonitoring' connections constitute, in Goldstein's terms, a 'cortical apparatus' for the transduction of a set of motor commands, perhaps fairly abstract or perhaps quite concrete, into a set of auditory correlates of those commands. Disruption of this transduction, we can now understand, occurs not only in brain-damaged aphasics but also in normal speakers, with predictable effects: Delayed auditory feedback or masking auditory input can result in a breakdown of articulation, as the expected auditory effects of one's own speech that the arcuate fasciculus makes available to Wernicke's fail to match actual auditory input. This could help to explain why central aphasics can recognize their own speech errors but have difficulty correcting them: External feedback enables them to hear that what they've said sounds wrong, but they have no access to what it *should* have sounded like.

With regard to the posterior-to-anterior, 'parroting' connections (again see Figure 2), this forward-running 'cortical apparatus' performs a transduction of the perceptual analysis of speech input into units of speech output. During the era of the Myth of G, because of the continuing domination of articulatory over auditory units as the fundamental units of representation, such a transduction has been seen as a necessary stage in the perception of speech. Central aphasia, and speech perception itself except when the researchers beg the question by using phoneme recognition as the gauge of perception, reveals little justification for this claim. Indeed, as Harold Goodglass (1993:96) has noted, if speech perception, which is intact in aphasics with intact Wernicke's areas, necessarily involves phoneme recognition, then

> …aphasics with lesions anterior to (or downstream from) Wernicke's area should have tacit knowledge of the phonology of words that they are attempting to name, even when they cannot implement the articulation. This is simply not the case. Goodglass *et al.* (1976) found that Broca's aphasics were not significantly better than chance in identifying the first sound or the number of syllables of a target word. Conduction aphasics, who were superior to all other subgroups, could do so for only one-third of the targets that they failed to name. [As a semantic priming effect of their having tried to use the meaning of the target to trigger their output, the conduction aphasics were in a 'tip of the tongue' state with regard to some portion of the words they failed to repeat correctly.—HSS]

However, in the absence of this transduction function, central aphasics—and conduction aphasics more generally—lack the capacity to imitate and therefore, in fact, the capacity to add new words to their active vocabularies. Conduction aphasics can only add words to their *passive* vocabularies! They have, indeed, as Goldstein says, lost their *Wortbegriff*. As aphasics go, they appear to have lost little: They still understand everything they hear, and they express themselves adequately. But they have no faculty of verbal thought, no capacity for active vocabulary growth, no possibility for verbatim repetition of what someone has said to seek clarification of it, and—perhaps worst of all—no ability to premonitor their own output in search of the *bon mot* or even of the *mot juste*, to say nothing of the *double entendre*, the clever pun, or the deceptive phrase. Could a conduction aphasic ever successfully run for elective office?

The dialectical-processual model of language knowledge sees all essential language knowledge as procedural know-how rather than declarative know-that knowledge, and it emphasizes the dynamic bifurcation of receptive and expressive processes as the single most important ingredient in the long-sought explanation of 'the creative aspect of language use'. Isn't it ironic that in constructing a possible framework for the attainment of this Holy Grail of linguistic science we have begun by rejecting the long-sacred Myth of G?

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[1] I must first acknowledge the generosity and delicacy with which my Binghamton University colleague Saul Levin, after hearing the present paper at *LACUS XXV* in Claremont, brought to my attention that I had made an elementary translation error in my attempt to render 'Editors, saboteurs' into French. My initial attempt, 'Éditeurs, saboteurs', would, Saul noted, work only for an anglophone audience, because 'editor' translates into French as *rédacteur*. I felt mortified until I realized that my mistake exemplifies exactly the kind of receptive/expressive disparity the present paper aims to elucidate: I knew immediately that Saul's correction was valid, because the correct French word is a long-standing element in my passive French vocabulary. However, my active vocabulary (at the time, but I hope not now) lacked the corresponding element, so that when I attempted to render this meaning into French I (presumably) resorted to the strategies for French word formation that generally serve me well for the creation of French words when I need them. Self-monitoring of this output didn't help, because the presence of the correct word *édition* in my passive vocabulary, with the help of word-analyzing strategies that generally serve me well for the comprehension of French words when I hear them, made the erroneous *éditeur* immediately intelligible to me in the intended sense. I'm confident, by the way, that a French reader would, for this same reason, have understood what I meant. However, in order to avoid misleading my anglophone readers regarding the French word for editor, and to avoid irrelevant 'oops!' responses by readers whose expressive French is better than mine, who would immediately realize that their output rendition of the intended meaning would be *rédacteur*, I have altered my *bon mot* (pronounced 'Bonn Mott' according to my *collègue canadien* Gary Prideaux) to conform to Standard French usage, with *mille mercis* to Saul.

The present paper is the first published product of a still incomplete project on the dialectical-processual linguistic significance of conduction aphasia. This project began as a presentation to the Language Origins Workshop at the University of Chicago (21 April 1994), continued with Karen Landahl and her students the day after, and benefitted from interaction with my colleagues in the Center for Cognitive and Psycholinguistic Sciences and in the Program in Philosophy and Cognitive and Computer Sciences at Binghamton University on several occasions. I feel quite sure that no one in any of these audiences accepted my beginning or my final positions on all the issues raised; if they had I would have modified my position so as to deny anyone the impression of total and inevitably ephemeral agreement. Therefore, these people all remain blameless for my errors of fact or interpretation, but they also deserve my gratitude for their attention and intellectual encouragement, whether through support or confutation.

This paper is dedicated to the memory of 'my other mother', Marvita Belle Kreag Eley, who introduced me to the work of Kurt Goldstein before I was even in my teens.

[2] Unless otherwise noted, all translations from French are by the present author (HSS).

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VII. COGNITIVE LINGUISTICS

THE MAGICAL LEXICON OF FIGHTERS AND LOVERS: TOWARD A CRITICAL COGNITIVE GRAMMAR

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In the 1997 film *As Good as It Gets*, Jack Nicholson gives an Oscar-winning performance as Melvin Udall, 'an obsessive-compulsive novelist with Manhattan's meanest mouth'.[1] Viewers get their first taste of Melvin's mean mouth in a scene precipitated by his decision to shove a neighbor's little dog down a garbage shoot. The neighbor, a gay artist named Simon who is preparing with his dealer to entertain friends and prospective buyers, asks Melvin if he's seen 'Verdell'. Melvin responds by asking if Verdell is the 'colored man I've been seeing in the hall,' whereupon Simon changes gears by bringing the 'colored man' into the picture and introducing him to Melvin.

(1) Simon: Frank Sachs, Melvin Udall.
Melvin: How ya doin'?
Simon: Frank shows my work, Mr. Udall. I think, yea, I think you know that.
Frank: People are going to start coming, please!
Melvin: What I know is, as long as you keep your work zipped up around me, I don't give a rat crap what or where you shove your show. Are we done being neighbors for now?

Frank smiles uncomfortably at Melvin and then starts to lunge at him.

Frank: Let me talk to you…

Simon quickly grabs Frank and holds him back.

Simon: No, no, no! Not worth it… definitely not worth it.

As the movie develops, we learn that Melvin is a dysfunctional human being suffering through a rather narrow existence focused almost entirely on the power of his words. As evident in this exchange, Melvin's linguistic virtuosity includes a rather rich repertoire of fighting words, 'which by their very utterance inflict injury or tend to incite an immediate breach of the peace' (Chaplinsky vs. New Hampshire, in Bosmajian 1983:134) In this exchange, Melvin's strategic manipulation of abusive language succeeds in intimidating Simon and moving Frank nearly to the point of initiating physical violence.

1. A Haunting Experience. As a linguist, I hardly need to be reminded of the fact that words are wondrous devices. Nonetheless, I got a very powerful reminder early in the afternoon of July 2, 1997. While driving alone down the interstate from Chicago's O'Hare Airport to my home in central Illinois, I found myself reflecting energetically on a heated conversation that I had taken part in a few hours earlier. About an hour into my two-and-a-half hour drive, I had a keen insight which I immediately articulated in words audible only to me and an array of inanimate objects inside our family minivan. Although unheard by any other person, those words served a very important purpose: they helped me record my insight for further reflection later. This paper is, at least in part, a product of those reflections.

The average person doesn't pay much attention to the average word. However, there are some words which have such a powerful effect that they can grab almost anyone's attention and hold it, perhaps even squeeze it, for an inordinately long period of time. My reflections that July afternoon alone in my minivan were focused on just such a word: *dickweed*. My attention became riveted on *dickweed* for the same reason that cameras flash and spectators rise to their feet when a boxer delivers a knockout punch. Only in this case, I was the one on the floor wondering what hit me! *Dickweed* was the term that had knocked me out of the verbal battle in (2), which took place in front of a small deli stand in the International Terminal at O'Hare on the morning of July 2, 1997.

(2) Employee: Can I help someone?
300-pounder: Yeah, I'd like…
Me: Hey, we've been waiting here for a long time and you just walk up and order?
300-pounder: She asked me, pal!
Me: I'm not your pal, asshole!
300-pounder: Talk's cheap, dickweed!

It would be an understatement to say that this paper was inspired by the episode in (2). To be quite honest, I've been haunted by *dickweed* since the moment I heard it in front of that deli stand. I had never heard the word before, but from the very moment my 'pal' hit me with it, I knew that it packed a wallop. I just wasn't sure how it did so, and my mind really wouldn't let the episode rest in my experiential history until I had made sense of the power of *dickweed* and words like it.

On the trip home from Chicago that afternoon, I initiated a process of reflection which I hope to propel toward completion in this paper. This process has had a spiral structure, the first round of which was completed in my reflective drive down

1-55 that afternoon, when I blurted out to myself 'He was calling me a pubic hair' and laughed with joy, amazement, and a small bit of admiration. That discovery initiated a round of analysis through which I appealed to the contemporary theory of metaphor to figure out first how the image of a weed is mapped onto the cognitive domain of male genitalia and then how my 300-pound 'pal' mapped this already metaphorical image onto his experience of me right there in the airport (Hawkins 1998a). This analysis helped me understand the string of conceptual associations between *dickweed* and me, but it left the fundamental question still unanswered: how do these magic words gain their power? In this paper, I will pursue an answer to this question by considering the hypothesis that the semantics of magic words involves iconographic reference.

This study emerges from a broader program of cognitive linguistic research into texts structured strategically to establish and/or maintain power relationships. To date, my work in this area has focussed on the phenomenon of iconographic textual reference. Briefly, iconographic texts involve a referential process which is mediated by a cognitive model comprising a coherent set of highly valued images. I refer to such a cognitive structure as an iconographic frame of reference. This research on iconographic reference has been inspired most directly by recent work on the semantics of value systems by Lakoff (1996), Johnson (1993) and Turner (1991). All of this work, in turn, has been informed by and contributes to a growing body of work from a Cognitive Linguistic perspective on metaphorical reasoning, which has been a central focus in Cognitive Linguistics for almost two decades.[2]

This research program is conceptualized as a means of exploring possible avenues of productive interaction between two of the most vital research paradigms of our time: the scientific study of the human mind and the critical analysis of human culture and reasoning. This paper will, therefore, close with a brief discussion which provides a prospectus on efforts to forge a hybrid theoretical perspective on language which I will call Critical Cognitive Grammar.

2. A PROCESS PERSPECTIVE ON MEANING. A lot of important insights on human language have been gained by viewing meaning as a function of truth. This perspective on meaning takes truth as a given, in effect assuming truth to be an absolute metric relative to which interlocutors negotiate meaning and theorists explain the same phenomenon. But what happens when the nature of truth itself is cast into doubt? This is precisely the problem presented to contemporary scholars in semantics by the raging debate over scientific methodology in the pursuit of knowledge and truth. While some cognitive scientists may take it as unproblematic to assume that truth is a fundamental law of nature, postmodern critical theorists have argued that truth, like many other fundamental concepts, is socially constructed and must, therefore, be understood relative to a critique of the social contexts from which it derives its currency.

I assume that cognitive linguists are not presently in a strong position to resolve this conflict. But neither can we defer further work in semantics until this controversy resolves itself. My solution to this metatheoretical problem is to work from a perspective that recognizes the importance of truth, but not as a fundamental building block of meaning. Instead, I view truth as a crucial goal of our meaning-making processes. For my work in this research program, I have adopted a perspective which takes seriously the observational fact that *meaning* is derived from the verb *to mean* and the progressive morpheme *-ing*. From this perspective, meaning is seen as a process of constructing understandings—of people, of events, of texts. In many cases, the truth of these carefully constructed understandings is not a significant issue. We recognize that we cannot yet grasp the truth of some experience, but we also recognize that such a state of ignorance cannot force us to exclude such experiences from our textual interactions. Indeed, we quite regularly use texts strategically in our efforts to make ultimate sense of an experience, i.e., to discover the truth about that experience. In other words, we often appeal to conceptual, linguistic resources to construct contingent understandings in the hopes that doing so can lead to less tentative understandings and, ultimately, to discovery of the truth.

In effect, meaning is a matter of telling stories to make sense of human experience. This perspective leads to the conclusion that particular meanings are time-bound events which reflect particular episodes of interaction between three processes involved in the human activity of making sense: experience, selection, and grounding. The process of experience provides the basic resources from which any meaningful text is derived. As no text can ever include all relevant information pertaining to any experience, any text must be selective in the information it presents. This process of selection appeals to sets of conceptual tools such as those discussed in Langacker 1987. All texts are constructed in a particular pragmatic context, which in itself is rich with resources which can contribute to the meaning of a text constructed in that context. Grounding is the process through which the pragmatic context is meaningfully related to images selectively constructed from experience. Selection and grounding work together in the construction of meaningful images from experience. The particular conceptual tools accessed and the particular information selected for presentation as a textual image depend directly on the nature of the information needed to construct the image that a speaker or writer intends to convey to a particular audience in a particular context.

3. ICONOGRAPHIC REFERENCE. This process perspective on meaning in general yields a process perspective on reference. From this perspective, 'reference' is taken quite literally to mean the process of directing attention or turning to some fundamental resource for information. The resource in this case is embodied human experience of particular things or people. When reference is iconographic in nature, the selection process brings into the picture an iconographic frame of reference to mediate the reference process and ultimately impose a recognizable,

conventionalized structure to the particular act of reference. An iconographic frame of reference (or 'iconography' for short) is a conventionalized cognitive structure comprising a coherent set of highly valued images. Iconographic frames of reference are built on the foundation of an experience (or set of experiences) that is highly valued in some domain of human life. We can refer to these as root experiences of the iconography.

In this section, we will take a brief look at two iconographic frames of reference, each of which derives its conceptual power from the root experiences of life and death. By appealing to such an iconography in a given act of reference, the speaker or writer who initiates the act of reference conceptually turns that act of reference into a matter of life and death.[3]

3.1 The *Warrior* Iconography. In recent years, a significant number of decision-oriented American public discourses have exhibited a simplistic structure that is hauntingly familiar. One concrete example is the case of Susan Smith. Until a few years ago, Susan Smith lived a life of relative obscurity and quiet anonymity. When she reported the disappearance of her two sons on the evening of 25 October 1994, Susan Smith immediately found herself embarking on a wild ride of highly value-laden public images. In the relatively short span of eight months, Susan Smith underwent no less than three significant transformations in her public image. She began this tumultuous period in the same state of relative anonymity that characterizes most of our lives. Then, when her tale of carjacking and kidnapping was broadcast across the nation, Susan Smith experienced a meteoric rise to the status of an American icon: the quintessential protective, nurturant mother. This powerful image disappeared only nine days later, when it was announced that Susan Smith had confessed to letting her car roll down a boat ramp into the waters of John D. Long Lake with the windows rolled up and her two sons strapped snuggly inside. Susan Smith immediately became the antithesis of her previous public image. Her new public image was captured quite powerfully and succinctly in the words of one person quoted in *time* magazine (November 14, 1994): 'She's slime, just slime'. Susan Smith's defense attorney, recognizing that his task was to counter this negative image, constructed an image of Susan Smith as the victim of not one but two abusive fathers. Her biological father, Harry Vaughan, subjected her to the ultimate abandonment when he chose to commit suicide in 1977, while her stepfather, Beverly Russell, regularly abused her sexually over a period of more than five years. On 28 July 1995, a jury accepted this victim defense enough to reject the death penalty for Susan Smith and recommend instead that she be sentenced to life in prison. After 278 days, Susan Smith's wild ride—from anonymity to hero to villain to victim—had come to an end (Hawkins 1998b).

What I find most haunting about Susan Smith's wild ride is that it is far from unique. Just ask O. J. Simpson, Richard Jewell, Latrell Sprewell, Mary Kay Letourneau, Bill Clinton, and Kenneth Starr, among others. Despite the wide range of differences that should be apparent across these distinct episodes, each is structured on the basis of a hierarchical conceptual system comprising a very familiar set of images—the HERO, the VICTIM and the VILLAIN. I refer to this structure as the WARRIOR iconography.[4] The HERO and the VICTIM are directly associated to the root experience of life. The former is seen as the protector of life and the latter as evidence of a threat to life in this particular social order. The VILLAIN, seen as an agent of death, constitutes that threat to life and provides this structure with its direct association to the root experience of death.

3.2 THE HUMAN BODY ICONOGRAPHY. The human body is the instrument through which human beings experience life. Any threat to the well-being of the human body, therefore, is a threat to life as humans know it. Evident in (3) is the fact that Adolph Hitler took strategic advantage of this simple set of understandings in crafting his inflammatory anti-Semitic rhetoric.

> (3) Bear in mind the devastation which Jewish bastardization visits on our nation each day, and consider that this blood poisoning can be removed from our national body only after centuries, if at all; consider further how racial disintegration drags down and often destroys the last Aryan values of our German people, so that our strength as a culture-bearing nation is visibly more and more involved in a regression and we run the risk, in our big cities at least, of reaching the point where southern Italy is today. This contamination of our people is carried on systematically by the Jew today. Systematically these black parasites of the nation defile our inexperienced young blonde girls and thereby destroy something which can no longer be replaced in this world.
>
> (*Mein Kampf*, quoted in Bosmajian 1983:19–20)

In this text, Hitler appeals to iconographic reasoning in metaphorically equating the Jewish people with bodily experiences of blood poisoning and contamination. This referential move proved so effective for Hitler that he used it to vilify others he perceived as enemies of the Third Reich. This is evident in (4), where Hitler identifies his communist enemies in Russia with pestilence, poison and bacillus. This provides the basis for Hitler's call for a systematic immunization of the German people against the pathogens from the east.

> (4) This pestilence will ask no man's permission to put an end to the democracies through the Marxist leadership, [and] it will do so without any man's leave, unless it meets with opposition. And this opposition must be something else than merely Platonic rejection of the doctrine, or any more or less solemn proclamation of hostility: there must be an immu-

> nization of the people against this poison while the international carrier of the bacillus must be fought.
>
> (*Hitler's Speeches*, quoted in Bosmajian 1983:23)

Hitler's discourse of dehumanization and vilification makes strategic use of an iconography constructed from understandings of the human body. The power of this particular iconography derives from the understanding that the human body is the locus of life as humans experience it. In other words, the human experience of life is mediated through the human body. Pathogens pose a significant threat to the integrity of the human body by initiating dynamic processes of deterioration within the body which can ultimately lead to death.

4. ICONOGRAPHIC REFERENCE IN THE SEMANTICS OF FIGHTING WORDS. Harper Lee's Pulitzer prize winning novel, *To Kill A Mockingbird*, provides some excellent examples of appeals to fighting words in particularly stressful situations. Lee's story is set in the small southern town of Maycomb, Alabama during the mid 1930s. The story focuses on the trial of a young black man by the name of Tom Robinson who is accused of rape by a lonely, young white woman after he had resisted her romantic advances. The passage in (5) is from a courtroom scene in which Mayella Ewell, the alleged rape victim, is being cross-examined by Mr. Robinson's defense attorney, Atticus Finch. After a sequence of questions which seriously cast into doubt many important details of her story of the alleged rape, Mayella Ewell launches into a verbal tirade in which she appeals to fighting words to refer to Tom Robinson as a 'nigger' and to address those who might question her rape story (with special attention to the defense attorney, Atticus Finch) as 'yellow stinkin' cowards'.

> (5) When Atticus turned away from Mayella he looked like his stomach hurt, but Mayella's face was a mixture of terror and fury. Atticus sat down wearily and polished his glasses with his handkerchief.
>
> Suddenly Mayella became articulate. 'I got somethin' to say,' she said.
>
> Atticus raised his head. 'Do you want to tell us what happened?'
>
> But she did not hear the compassion in his invitation. 'I got somethin' to say an' then I ain't gonna say no more. That nigger yonder took advantage of me an' if you fine fancy gentlemen don't wanta do nothin' about it then you're all yellow stinkin' cowards, stinkin' cowards, the lot of you. Your fancy airs don't come to nothin'—your ma'amin' and Miss Mayellerin' don't come to nothin', Mr. Finch.'
>
> Then she burst into real tears. Her shoulders shook with angry sobs.
>
> (Lee 1960:187–88)

Clearly, much needs to be said about the semantics of *nigger* and *yellow*, but I will reserve that discussion for a different paper in which I can focus attention directly on the iconographic bases of color-oriented racial discourse. Space available in the present forum makes it impossible to do a satisfactory job of that here. Consequently, our analytic attention at this point will focus on the terms *stinkin'* and *cowards*.

The magical power of *cowards* in this passage can be explained relative to the lofty status of the HERO image in the WARRIOR iconography. Although Mayella Ewell may see Atticus Finch and other doubters of her rape story as enemies, she does not appeal to the VILLAIN image in her verbal attack. Instead, she refers to them as *cowards*. In stark contrast with a HERO, who earns respect and adoration for his/her readiness to risk injury or death by confronting the VILLAIN, a coward deserves our disdain for unwillingness and/or inability to confront the VILLAIN on the field of battle. The negative value Mayella Ewell expects her audience to assign to *cowards* can, therefore, be explained as a product of the positive value conventionally assigned to the HERO image and the alleged inability of the so-called cowards to fulfill the expectations of the HERO.

Before turning our attention to the semantics of *stinkin'*, let us consider another passage from *To Kill A Mockingbird* involving a confrontational situation in which the interlocutor who goes on the offensive rejects the VILLAIN image in conceptualizing the opposing interlocutor. Soon after his accuser is excused from the witness box, Tom Robinson takes the stand to give his account of his problematic encounter with Mayella Ewell. After a cooperative interrogation by his defense attorney takes him through a string of events which led up to the accusation of rape, the prosecuting attorney, a Mr. Gilmer, assumes a much more adversarial tone in cross examining Tom Robinson. The passage in (6) is from that exchange.

(6) 'Do you deny that you went by the house?'
'No suh—she said she had somethin' for me to do inside the house—'
'She says she asked you to bust up a chiffarobe, is that right?'
'No suh, it ain't.'
'Then you say she's lying, boy?'
Atticus was on his feet, but Tom Robinson didn't need him. 'I don't say she's lyin', Mr. Gilmer, I say she's mistaken in her mind.'
…
'Didn't Mr. Ewell run you off the place, boy?'
'No suh, I don't think he did.'
…
'But you weren't in a fix—you testified that you were resisting Miss Ewell. Were you so scared that she'd hurt you, you ran, a big buck like you?'
'No suh, I's scared I'd be in court, just like I am now.'

> 'Scared of arrest, scared you'd have to face up to what you did?'
> 'No suh, scared I'd hafta face up to what I didn't do.'
> 'Are you being impudent to me, boy?'
> 'No suh, I didn't go to be.'
>
> (Lee 1960:197–98)

A significant part of the power of *boy* in this context is that Tom Robinson is not a boy. Indeed, Mr. Gilmer seems to acknowledge that Tom is a physically mature man in calling him 'a big buck'. The term *boy* has been used derisively for generations to refer to black males. While this acknowledges the conventionality of the term as used in (6), it does not account for the derisiveness of the term. In many contexts, there is no significant shame in being a boy. Quite to the contrary, even in those contexts in which bad things happen because 'boys will be boys', it is often considered a good thing to be a boy. Contexts in which it is problematic to be a boy are those in which you 'don't send a boy to do a man's job'. These include contexts where the HERO engages the VILLAIN on a field of battle. Thus, as with *cowards*, the negative value associated with the term *boy* in racist discourses such as (6) can be explained as a product of the positive value conventionally assigned to the HERO image and the inability of immature males to fulfill the expectations of the HERO role.

Let us turn our attention now to the case of *stinkin'* used as a fighting word in (5). In attempting to make sense of the magical force of the term in that context, it is useful to note that a significant number of fighting words relate directly to the bodily experience of expelling waste products. Fighting words like *asshole* and *dickweed* in (2) are clearly associated with parts of the body where waste products are expelled. Similarly in (1), Melvin Udall alludes to the penis in warning his gay neighbor to 'keep your work zipped up' and to the anus in his reference to 'where you shove your show'.

The magical lexicon also includes terms referring to the waste products themselves. For example, in an assigned paper on a personal experience with fighting words, one undergraduate student reported the pain his father inflicted by calling him 'a worthless piece of shit'.[5] Melvin Udall's reference to 'a rat crap' in (1) is further evidence of the utility of waste product terms as fighting words.

Against this background, the magical force behind *stinkin'* becomes almost as clear as the nose on your face. The waste products expelled by the human body generally have odors that are considered quite unpleasant. I suggest that Mayella Ewell's use of *stinkin'* in (5) emerges from a coherent system of fighting words associated directly with the human body iconography. Negative value is ascribed to something that must be expelled from the body if life within the body is to be protected. It seems to be a natural step to generalize from things to be expelled from the body (pathogens) to things that have been expelled from the body (waste products) and body parts where the expulsion occurs.

5. (IN)CONCLUSION: TOWARD A CRITICAL COGNITIVE GRAMMAR. This paper has considered the hypothesis that the magical force behind fighting words results from iconographic reference. The lexical-semantic analyses presented in section 4 suggest, at the very least, that this hypothesis is plausible. For a paper grounded exclusively in linguistics as a cognitive science, this might be as far as the discussion would need to go. I have established independent motivation for hypothesizing that iconographic cognitive structures play a crucial role in texts crafted strategically to establish and maintain power relations. In section 4, I have shown that a range of distinct fighting words can be reconciled into coherent semantic sets by characterizing those terms relative to previously hypothesized cognitive iconographies.

But it would be premature to draw this discussion to a close without attending to the fact that these cognitive resources are all too routinely manipulated in ways that result in human pain and suffering. In this regard, it is important to note that the confrontational exchange in (6) led directly to a scene in which a little white boy by the name of Dill, who was witnessing the courtroom drama from the 'colored balcony,' was forced to leave the courthouse in tears. The text in (7) occurs when Dill was asked to explain his tears.

(7) 'It was just him I couldn't stand,' Dill said.
'Who, Tom?'
'That old Mr. Gilmer doin' him thataway, talking so hateful to him… The way that man called him 'boy' all the time an' sneered at him, an' looked around at the jury every time he answered—'
'Well, Dill, after all he's just a Negro.'
'I don't care one speck. It ain't right, somehow it ain't right to do 'em that way. Hasn't anybody got any business talkin' like that—it just makes me sick.'
(Lee 1960:198–99)

I take Cognitive Linguistics to be a matter of science. In his recent book *Critical Discourse Analysis*, Norman Fairclough calls for a linguistics with a social conscience. As I stumble through developments in this research program, I find myself moving inexorably toward a rational reconciliation of cognitive and critical approaches to linguistic theory. The theory that I am working toward does not differ in any substantive way from that emerging from Langacker's work on Cognitive Grammar. And yet, I am excited because I find myself forging a wonderful new dimension to that theory. My contribution is not really in the domain of science, however. It is, instead, in the domain of social conscience. Fairclough (1995) seeks a linguistic theory that could help a good-hearted father explain fighting words to his daughter in a way that might help her understand and counteract their usage. The passage in (8) demonstrates that Atticus Finch is clearly in need of such help.

(8) 'Atticus,' I said one evening, 'what exactly is a nigger-lover?'

Atticus's face was grave. 'Has somebody been calling you that?'

'No sir, Mrs. Dubose calls you that. She warms up every afternoon calling you that. Francis called me that last Christmas, that's where I first heard it.'

'Is that the reason you jumped on him?' asked Atticus.

'Yes sir…'

'Then why are you asking me what it means?'

I tried to explain to Atticus that it wasn't so much what Francis said that had infuriated me as the way he had said it. 'It was like he'd said snot-nose or somethin'.'

'Scout,' said Atticus, 'nigger-lover is just one of those terms that don't mean anything—like snot-nose. It's hard to explain—ignorant, trashy people use it when they think somebody's favoring Negroes over and above themselves. It's slipped into usage with some people like ourselves, when they want a common, ugly term to label somebody.'

'You aren't really a nigger-lover, then, are you?'

'I certainly am. I do my best to love everybody…'

(Lee 1960:108)

This paper has shown quite clearly that Atticus is wrong. Fighting words like *nigger-lover* and *snot-nose* have very clear and powerful meanings. The analytic resources of Cognitive Linguistics provide important tools for making sense of those sometimes overpowering meanings.

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[1] Kenneth Turan, *Los Angeles Times*, quoted on the dustcover of the video.

[2] Cf. Lakoff & Johnson 1980, Johnson 1987, Lakoff 1987, Turner 1987, Lakoff & Turner 1989, Sweetser 1990, Lakoff 1991, Lakoff 1993, Reddy 1993.

[3] Further development is presented in Hawkins 1998c.

[4] Lakoff 1991 discusses this same structure briefly, referring to it as the fairy tale of the just war.

[5] The student was enrolled in my undergraduate semantics class during the Fall semester or 1996. Because of the sensitive and personal nature of the tale, I do not want to identify the student by name. I do, however, want to acknowledge my indebtedness to the student for this useful example.

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PATH SETTINGS, SUBJECTIVE MOTION, AND THE FINNISH PARTITIVE SUBJECT

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In their canonical function, path expressions (*from X to Y*) combine with motion verbs to indicate the spatial limits of the motion. A sentence with a path expression normally designates a dynamic situation (or a process in the sense of Cognitive Grammar; cf. Langacker 1987, 1991a) where a mover leaves one location (the source) and approaches another (the goal), occupying different intermediate positions at different points in time. The process is perfective: it starts when the source is left and ends when the goal has been reached. A typical example is 1, depicted in Figure 1.

(1) Elmer ran from his house to the railway station.

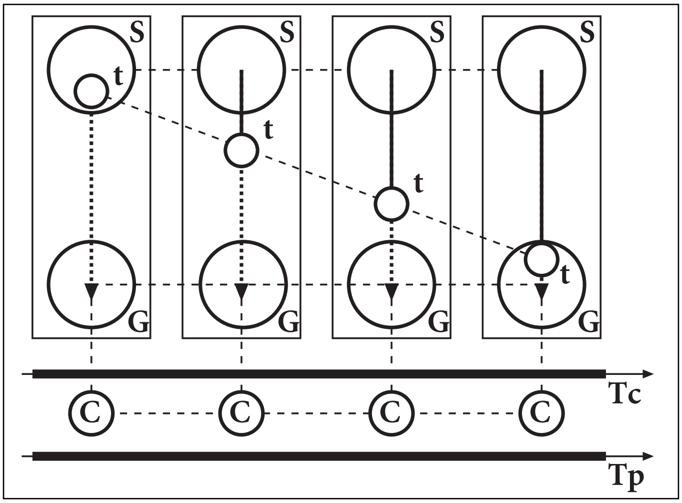

Figure 1. Example (1): The trajector (t) leaves the source (S) in the first configuration, approaches the goal (G), and reaches it in the last configuration. The process proceeds in conceived time (Tc), and is processed sequentially by the conceptualizer (C) in processing time (Tp). (See Langacker 1991a:248–53.)

As can be seen in Figure 1, the mover's position between the source and the goal changes with time and can be represented as a sequence of locative configurations, each of which shows one spatial position of the mover with respect to the two landmarks. According to Cognitive Grammar, the predication is processed by the conceptualizer with a strategy called SEQUENTIAL SCANNING, where a series of component states are activated successively in a non-cumulative fashion (Langacker 1991b:78–81), as if following mentally the mover when it moves through space and time. Since the situation is dynamic and motion is involved, the mover is the element to be selected as the SEMANTIC STARTING POINT of the sentence (for the term, see Langacker 1991a:293). This means, roughly, that the mover is the prominent participant whose viewpoint we assume in viewing the situation, and whose spatial position we follow in the course of time.

In the following discussion I will show how path specifications sometimes take on a more autonomous function reminiscent of a clause-level setting adverbial. In particular, this happens in complex examples where several nominal elements modify the verb. As a result of their greater semantic autonomy, these PATH SETTINGS sometimes allow the verb to designate a state instead of motion. Their independent status leaves open the possibility that the motion is not objective but fictive, or subjective (a canonical example of subjective motion would be *This freeway goes from San Diego to Los Angeles*, where the motion verb *go* is used even though the freeway remains stationary; for details, see Langacker 1991b: chapter 5).

The special functions of path settings are discussed in section 1. The last two sections, 2 and 3, utilize path expressions in a study of the case variation in the Finnish subject between the nominative of non-existential sentences and the partitive of most existentials. It is my assumption that the dynamic spatio-temporal dimensions brought about by the path expression highlight certain important but normally backgrounded semantic facets of the existential construction, and thus have an important role in clarifying the boundary between existential and non-existential predications in general.

1. PATH SETTINGS.

In syntactic terms, path expressions are typical verb (or VP) modifiers, as opposed to clause-level setting adverbials. Many motion verbs (e.g., *come*, *go*) take a directional locative modifier, and one may be tempted to hypothesize that with motion verbs path expressions are always verb-modifiers. However, the following examples show that the situation is not quite so straightforward.

(2) Elmer travelled from Venice to Rome.
(3) ?From Venice to Rome, Elmer travelled.
(4) Elmer travelled from Venice to Rome by train.
(5) From Venice to Rome, Elmer travelled by train.

(2) displays the tightest connection between the path and the verb; the sentence would be ill-formed (or clearly elliptic) without the path, and fronting the path is disfavored ((3) is strongly emphatic, if acceptable at all). (4) is already different, even though it has the same motion verb as (2). The relevant difference is that (4) has another modifier, *by train*, whose presence seems to release the path expression (*from Venice to Rome*) into a more autonomous status. Note, in particular, that (4) would be well-formed even if the path were omitted (*Elmer travelled by train*), and also that fronting the path is now acceptable (5). The conclusion that suggests itself is that the path expression has reached the status of some kind of a setting adverbial in (5).

An even more interesting case in point are examples where the verb designates a state, not motion. Many such verbs take a static locative complement (*in*/*on*/*at* X), and typical path expressions, because of their inherent directionality, are not capable of complementing the verb (6).

(6) *Elmer was / stayed from Venice to Rome.

However, path expressions can be used as setting adverbials even with state verbs. In (7) this is possible because the verbs do not require a locative complement at all; (8) has both a path setting and the obligatory static complement.

(7) From Venice to Rome, Elmer slept / played chess.
(8) From Venice to Rome, Elmer stayed in the dining car.

In syntactic terms, we can say that the static *in the dining car* complements the verb in (8), and this combination results in a well-formed nucleus which can then be combined with a path setting. Semantically, however, the situation is not as unproblematic; the verb itself does not designate motion, yet we understand the example in a dynamic sense, where Elmer and the dining car are in motion from Venice towards Rome. The example thus successfully combines the properties of a static process and a dynamic setting, and results in what Fauconnier (1997:chapter 6) calls a BLEND. In Fauconnier's definition, a blend is the result of an operation that operates on two input spaces (in this case, a static and a dynamic relation) to yield a third space, the blend, which inherits partial structure from both input spaces, but also has an emergent structure of its own.

In spite of their special semantic nature, (7) and (8) share one important feature with more canonical path examples (e.g., (1)): it is the trajector of the process (Elmer) that moves along the path and maintains its identity over time. In a sense, then, the trajector ties together different component states of the process, and also different parts of the path. In cognitive semantic terms, this means that the trajector serves as a starting point with respect to both the static process and the motion. Example (9) is very different in this respect.

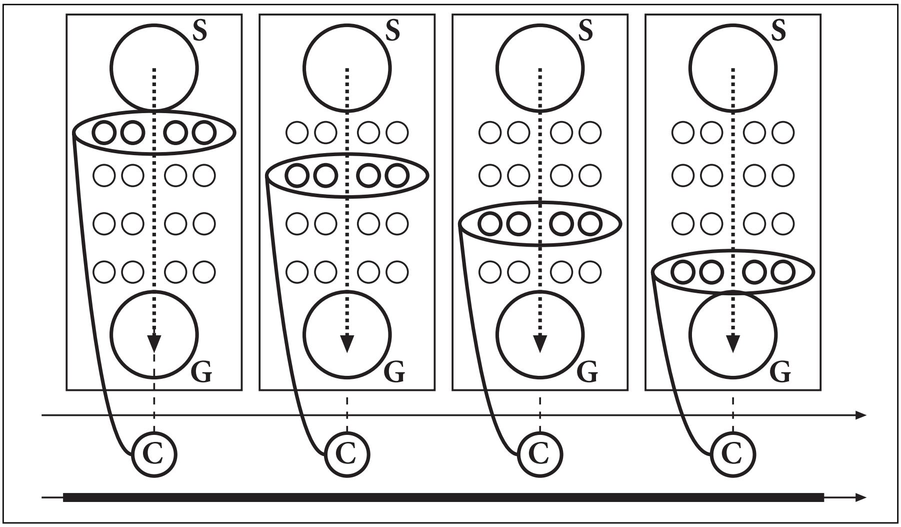

Figure 2. Subjective motion along a path. The motion involves only the focus of attention of the conceptualizer (C), when one scans mentally through the complex configuration as if following mentally the path in one direction. In each component configuration a different portion of the path is highlighted. The participants of the process do not move along the path.

(9) From Venice to Rome, little children were playing on the railway bed.

Even though (9) resembles (8) in combining a static process with implicit motion along a path, the nature of that motion is quite different in the two examples. In (9), unlike in (8), the referents of the subject stay in their place, and the sentence says that the children were scattered along the path and occupied the path for its full length. The entity experiencing the motion in (9) is external to the designated situation, and (9) is thus an instance of subjective motion (see Langacker 1991b:chapter 5)[1], which is the result of a mental operation by the conceptualizer who scans through the path and accesses different component configurations at different points in processing time. In each component configuration, a similar process (playing) is taking place, but with different participants. The special nature of (9) is depicted in Figure 2.

In the following sections, I use path expressions as an implement in unraveling a number of semantic differences between existential and non-existential constructions in Finnish. The existence of these differences has been acknowledged by previous scholars, but sufficient data to explain the situation has never been provided. Section 2 is a short introduction to the semantics and research history of Finnish existential clauses. Section 3 discusses existential vs. non-existential examples with a path specification, and shows that by highlighting the spatial and temporal extensions of the relation, the path expression can bring many underlying semantic differences on stage. My main argument will be that the partitive subject of existentials is not the starting point of the predication in the same sense as the normal nominative subject, but yields that function to the locative element, which hence becomes the primary element to be connected with the dimensions of time and space.

2. THE FINNISH 'PARTITIVE SUBJECT'. Probably the most controversial research problem in Finnish syntax has been the morphological case marking of the subject as either nominative or partitive. In general, nominative case is the unmarked alternative, and it is the only option in transitive, (non-existential) intransitive, and copulative sentences. The use of the partitive is confined to affirmative existential clauses with a mass noun or a plural subject; if negated, all existential subjects become partitive. This of course raises the question whether this element can be analyzed as a syntactic subject at all. Indeed, different scholars have given it different category labels, arguing for instance that it is actually an object, a predicate nominal, or simply a neutralization of the subject and object functions.

According to the prevailing view, the partitive subject designates an unbounded or open quantity that consists of either a substance (if the subject is a mass noun) or an indeterminate number of instances of the same category (in the plural). The nominative, in contrast, designates a bounded, or closed quantity (Itkonen 1974; Larjavaara 1988). As regards definiteness, the nominative subject has both definite and indefinite uses,[2] whereas the partitive subject strongly favors the indefinite interpretation in both affirmative and negative contexts (Vilkuna 1992:52–54). The verb shows number and person agreement only with the nominative subject; with the partitive, the verb takes an invariable 3rd person singular form.

Below are some examples to demonstrate these syntactic differences. All examples are in the plural, where the case distinction is more straightforward than in the singular. Example (10) is a typical non-existential locative predication, and (11) its existential counterpart. Observe the differences in subject-verb agreement and word order, where the unmarked position of the partitive subject is after the verb. Example (11)', shows, however, that the position of the partitive subject is not rigid (Karlsson 1978).

(10) Professori-t istu-i-vat kahvila-ssa.
Professor-PL.NOM sit-PST-3PL café-INE
'The professors were sitting in the café.'

(11) Kahvila-ssa istu-i professore-i-ta.
Café-INE sit-PST.3SG professor-PL-PAR
'There were professors sitting in the café.'

(11)' Professore-i-ta istu-i kahvila-ssa.
Professor-PL-PAR sit-PST.3SG café-INE
'There were professors sitting in the café.'

Ever since the earliest studies on Finnish existentials, a general consensus has prevailed that the main function of these constructions is to express the existence of the subject, not an activity (Airila 1924, Ikola 1954). This special function has also been seen as the reason for the exclusion of transitive and many 'colorful' (agentive) intransitive verbs from the existential construction. Ikola (1954), whose contribution launched a long and lively debate on the partitive subject, argued that an existential sentence always states a predication about the location denoted by the (typically clause-initial) locative element by reporting what the location contains, starts to contain, or ceases to contain. In his view, this function is independent of word order; thus both (11) and (11)' are predications about the 'café' in Ikola's (1954, 1955) sense. Penttilä (1956) pointed out that even one and the same verb may have different interpretations in existential and non-existential sentences, as the verb adapts its meaning to meet the semantic requirements of the construction as a whole. The existential sentence, in particular, requires the verb to become an (almost) 'meaningless' connector that only serves the function of connecting the locative element with the subject (Siro 1960, 1964; Hakanen 1980), or gives the relationship between the two a 'temporal extension', as Schlachter (1958) put it. Schlachter (1958) also argued that a plural partitive subject produces a 'collective' interpretation of the event, in contrast to the distributive interpretation of non-existential sentences (which, in his view, foreground the separate actions of different individual referents of the plural nominative subject).

Even though these characterizations may be intuitively plausible, they have remained vague and unexplained, in spite of getting repeated over and over again in later literature. The problem is that these alleged semantic differences are not very prominent in typical contrasting pairs of structurally simple examples (12) and (13).

(12) Lapse-t juokse-vat piha-lla.
Child-PL.NOM run-PRES.3PL yard-ADE
'The children are running in the yard.'

(13) Laps-i-a juokse-e piha-lla.
Child-PL-PAR run-PRES.3SG yard-ADE
'There are children running in the yard.'

If one looks at these simple examples only, it is indeed hard to defend the view that only (12) is about the children whereas (13) is about the yard (as argued by Ikola 1954, 1955). Neither is it clear how (12) should differ from (13) in expressing 'practically no activity'; both have, after all, a human subject performing the same volitional action of 'running'. The 'collective' meaning of (13), as opposed to the 'distributive' meaning of (12), also remains highly dubious. Speaking quite intuitively, the problem is that these semantic differences 'hang in the air' but do not result in actual meaning differences between simple examples like (12) and (13).

In the following section, I will argue that more complex examples are needed to demonstrate the differences. In particular, path expressions turn out to be a very useful implement in studying the problem, because they necessarily foreground both the spatial and temporal extensions of the process at the same time. My general hypothesis is that if the existential sentence is indeed a predication about a location, then the locative element (not the subject) should assume the function of the starting point and become the primary element connected with the dimensions of time and space.

3. PATHS AND THE PARTITIVE SUBJECT. In general, both existential and non-existential examples accept a path specification ((14) and (15)).

(14) Koululaise-t juoks-i-vat kirko-lta asema-lle.
schoolchild-PL.NOM run-PST-3PL church-ABL station-ALL
'The schoolchildren were running from the church to the railway station.'

(15) Koululais-i-a juoks-i kirko-lta asema-lle.
Schoolchild-PL-PAR run-PST.3SG church-ABL station-ALL
'There were schoolchildren running from the church to the railway station.'

At first sight, the only semantic differences between the two examples appear to be connected with definiteness and quantity as indicated by the subject in each case. In (14) the subject designates a bounded quantity of referentially familiar, or 'given', schoolchildren, whereas in (15) the quantity is unbounded and the reference new. The clause-level interpretation appears not to reveal much of the expected semantic differences; in both the schoolchildren perform a volitional, agentive action and move along the path. However, by adding a durative modifier to the examples, we can highlight the temporal extension of the process and observe more revealing differences.

(14)' Koululaise-t juoks-i-vat kirko-lta asema-lle
schoolchild-PL.NOM run-PST-3PL church-ABL station-ALL
kaksi tunti-a.
two hour-PAR
'The schoolchildren ran two hours from the church to the railway station.'

(15)' Koululais-i-a juoks-i kirko-lta asema-lle
schoolchild-PL-PAR run-PST.3SG church-ABL station-ALL
kaksi tunti-a.
two hour-PAR
'For two hours, there were schoolchildren running from the church to the railway station.'

The difference between (14)' and (15)' is well captured in their English translations. In (14)' the duration *kaksi tuntia* 'two hours' is the time it takes the children to traverse the path from end to end. In (15)', on the other hand, the overall duration of the event is monitored from the viewpoint of the path itself; for two hours, the path has children running along it. In particular, (15)' does not say that the running time of any individual child was two hours. Furthermore, neither (14)' nor (15)' implies that the children were running as one group, since both allow the reading where they started the track one by one (say, with 30-second intervals). Even if this is the case, the durative element in (14)' gets associated with the (average) running time of each child individually, whereas in (15)' it designates the overall duration of the event. This, of course, neatly supports Schlachter's (1958) idea that the opposition between distributive vs. collective readings is a central factor in setting existentials apart from non-existentials.

These semantic differences can be even more prominent if the locative element indicates only a goal (not a whole path); see (16) and (17).

(16) Muuttolinnu-t lentä-vät Suome-en kaksi viikko-a.
migratory-bird-PL.NOM fly-PRES.3PL Finland-ILL two week-PAR
'Migratory birds fly (in) two weeks to Finland.'

(17) Muuttolintu-j-a lentä-ä Suome-en kaksi viikko-a.
migratory-bird-PL-PAR fly-PRES.3SG Finland-ILL two week-PAR
'For two weeks, there are migratory birds flying to Finland.'

In general, examples where a motion verb takes a 'goal' as its complement allow different readings with respect to time. We can either focus our attention solely on the endpoint of the path (where the mover reaches the goal), or monitor a longer portion of the process that precedes the endpoint. Without the temporal modifier, both (16) and (17) would be vague as to which interpretation is to be made. But since the temporal modifier foregrounds the duration of the process, it also forces us to explicitly select the components that constitute the duration. Again, example (16) monitors the event from the viewpoint of the nominative subject. Because entering a space is in itself a punctual event (and cannot be modified for duration), another interpretation must be made where a longer portion of the process is included

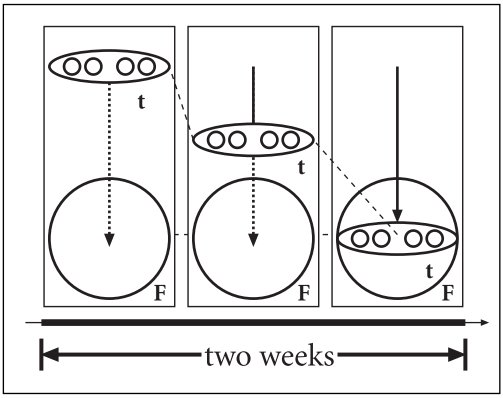

Figure 3. Example (16). The time span associates with the experience of the trajector (t), i.e., the group of birds, which first approaches Finland (F), and enters it in the last configuration.

within the scope of predication. This reading makes the total flight time of the birds (from some unspecified place to Finland) two weeks (Figure 3).

In (17), on the other hand, the location (the 'goal') assumes the function of a starting point, and the duration of the event is monitored from its viewpoint. Now the scope of predication cannot include events that take place outside the location, and the only way to lengthen the event is to assume that it is a replicate process in the sense of Langacker (1991a:118-125). In this interpretation, different arrivals by different birds are distributed over two weeks. Note that with respect to the subject, the durative element again gets a collective interpretation; it does not indicate the flight time of individual birds but the duration of the overall event (Figure 4).

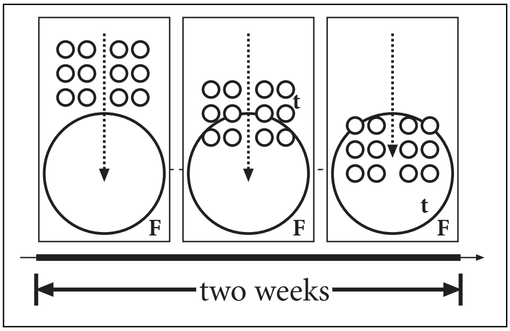

Figure 4. Example (17). The duration of the process is monitored from the viewpoint of the location; different arrivals by different birds constitute a replicate process that lasts two weeks. The entity that connects the successive components of the process with each other is not the mover but the location.

So far, in the examples discussed in this section, the path specification has always been part of the clause nucleus. If we now take a look at examples where the path is a setting for another containment relationship, additional semantic differences come up that distinguish existentials from non-existentials. Consider (18) and (19):

(18)	Kirko-lta	asema-lle	koululaise-t	juoks-i-vat	tienvarre-ssa.
	church-ABL	station-ALL	schoolchild-PL.NOM	run-PST-3PL	roadside-INE

‘From the church to the station, the schoolchildren ran along the roadside.’

(19)	Kirko-lta	asema-lle	koululais-i-a	juoks-i	tienvarre-ssa.
	church-ABL	station-ALL	schoolchild-PL-PAR	run-PST.3SG	roadside-INE

‘From the church to the station, there were schoolchildren running along the roadside.’

In both examples, the path functions as the outermost setting and includes all participants (the children) and their more specific location (the roadside) within its scope. We can easily draw a parallel between the present examples and the NESTED LOCATIVE CONSTRUCTIONS discussed by Langacker (1991a:177, 1991b:8–9), which comprise multiple locative predications where a scope relation exists between the hierarchically embedded locations (see also Huumo 1996). The main difference between (18) and (19) is that (18) gets a dynamic, objective-motion reading (where the children move along the path from end to end) but (19) has a static, subjective-motion reading (where the running children are merely scattered along the path). Note that (19) does not imply that any child actually ran all the way from the church to the station, nor does it imply that the direction of their running corresponded to the organization of the path; in fact, they may well have been running in the opposite direction. In cognitive linguistic terms, the motion along the path in (19) is subjective and arises as the result of a mental scanning operation by the conceptualizer.

In my view, this reading of (19) is caused by the internal semantic organization of the innermost containment relation (between the roadside and the children), which is understood in the existential sense and therefore selects the location (‘roadside’) as its semantic starting point. The children will only be accessed when the conceptualizer’s viewpoint has been shifted into the innermost space.

The hypothesis can now be formulated that in any multiple containment relation it is always the starting point of an inner containment relation that gets primarily related with outer settings. The nominative subject of (18) has a starting-point status with respect to both spaces (one static, the other dynamic), and thus the objective-motion reading is allowed where the children actually move along the path. The matters are different in (19), where both locations are conceptually independent of the subject. The children remain, in a sense, blocked within the inner location and are thus incapable of interacting directly with the path.

4. CONCLUSIONS. We have seen how path specifications, which typically have the function of a verb modifier, can take on the more independent status of a setting adverbial. As setting adverbials, paths may be autonomous with respect to the nucleus; the verb does not have to indicate motion at all, and in the extreme case even the participants in the process are merely scattered along the path instead of moving along it. In the latter (extreme) case, the only mover is the conceptualizer's focus of attention and the motion along the path is subjective. We also learned that path specifications can be successfully used as an implement in unraveling some crucial but normally backgrounded semantic differences between partitive and nominative subjects in Finnish. In particular, the discussion demonstrates that the partitive subject is not a semantic starting point whose activities and spatiotemporal position the sentence follows in the course of time. Rather, the partitive subject is always accessed as part of the content of a location, and it is in general incapable of participating in relationships external to the location.

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[1] In Cognitive Grammar, the difference between objective and subjective motion is closely related to the distinction between conceived time (= time as an object of conceptualization) and processing time (= time as a medium of conceptualization). In an example involving objective motion (e.g., (2)), conceived time and processing time develop in tandem, and the example denotes a process consisting of several static configurations that are arranged consecutively and scanned through mentally by the conceptualizer. In each configuration, a trajector occupies a location l_i at time t_i (of conceived time), and is accessed by the conceptualizer at processing time T_i (for details, see Langacker 1991b:157-160). In subjective motion, on the other hand ((9)), the notion of directionality is motivated by a change in processing time alone. The processing time evolves as the conceptualizer scans mentally through the complex configuration (the path) and accesses different participants in their respective positions along the path at different points in processing time. Conceived time alone cannot be used as a basis for ordering the configurations in time; in fact, all processes may well be going on simultaneously in (9) (imagine that the speaker is on a reconnaissance plane and sees the whole railway section at one glance).

[2] Finnish does not have a morphological marking system for definiteness.

[3] The following abbreviations are used in the glosses: ABL = ablative, ADE = adessive, ALL = allative, ILL = illative, INE = inessive, NOM = nominative, PAR = partitive, (person number+)PL = plural, PRES = present tense, PST = past tense, (person number+) SG = singular.

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ON THE AGENT/EXPERIENCER CONTINUUM: A COGNITIVE APPROACH TO THE *GA/NI* ALTERNATION IN JAPANESE

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This paper[1] deals with the so-called '*ga/ni* conversion' phenomenon in Japanese, which is a particle alternation affecting subject NPs. In Japanese, some transitive verbs of possession, ability and perception, such as *aru/iru* 'have,' *dekiru* 'be able,' *wakaru* 'understand,' and verbs with the ability auxiliary *reru/rareru* can appear in either a [NP$_1$ *ga* NP$_2$ *ga* VP] or [NP$_1$ *ni* NP$_2$ *ga* VP] clause structure, as shown in (1):[2]

(1) a. *aru/iru* 'have'
Taroo *ga/ni* kodomo *ga* huta-ri iru.
Taro NOM/DAT children NOM two-CL have
'Taro has two children'.
b. *dekiru* 'be able'
Taroo *ga/ni* furansugo *ga* dekiru.
Taro NOM/DAT French NOM be able
'Taro can speak French'.
c. *wakaru* 'understand'
Taroo *ga/ni* furansugo *ga* wakaru.
Taro NOM/DAT French NOM understand
'Taro understands French'.
d. *V-reru/rareru* 'can'
Taroo *ga/ni* furansugo *ga* hanas-eru.
Taro NOM/DAT French NOM speak-can
'Taro can speak French'.

I will argue that the *ga/ni* alternation is not a syntactic or stylistic phenomenon, as argued previously by Kuno (1973) and Shibatani (1978), but it is cognitively motivated by the semantic nature of the verbs as well as the semantic contribution of each particle, namely, *ga* and *ni*. Based on Langacker's (1991b) role archetype model, I will demonstrate that the *ga/ni* alternation is related to how the *ga*- or *ni*-marked NP is construed—as primarily indicating an AGENTIVE or an EXPERIENCER role.

1. PREVIOUS STUDIES. The *ga/ni* alternation has previously been treated as a purely syntactic or stylistic phenomenon. For example, Kuno states:

> When we have NP$_1$ *ga* NP$_2$ *ga* Verbal constructions, NP$_1$ *ga* can change to NP$_1$ *ni* in many instances (1973:88).

He also notes:

> Many of the verbals that can enter into the NP-*ga* NP-*ga* Verbal construction… can undergo the transformation that changes the first NP-*ga* to NP-*ni*. I shall call this transformation *Ga/Ni Conversion* (1973:338).

Thus, Kuno assumes the [NP$_1$ *ga* NP$_2$ *ga* Verb] construction to be the more basic clause pattern in Japanese and a conversion from NP$_1$ *ga* to NP$_1$ *ni* takes place for some stylistic reason.

In contrast to Kuno's claim, Shibatani (1978) assumes the [NP$_1$ *ni* NP$_2$ *ga* Verb] construction to be more basic, and that the nominative *ga* may replace the dative *ni* due to a general subject-marking constraint. Taking a syntactic approach to the *ga/ni* conversion, he notes:

> The nominativization (i.e., *ga*-marking of the subject NP) takes place obligatorily when there is no *ga*-marked NP in order to ensure at least one nominative NP… (1978:256) [translation mine]

These two analyses of the *ga/ni* alternation assume contradictory underlying structures, and neither of them provides a compelling account for the distribution of the two particles. As McGloin (1980) points out, a *ni*-marked subject may be acceptable even in a sentence without any other *ga*-marked NP. Consider the sentences in (2):

(2)	a.	Taroo	*ni (-wa)/?ga*	sonnani	hayaku	hasi-re-nai.
		Taro	DAT TOP /?NOM	so	fast	run-can-NEG
		'Taro cannot run so fast'.				
	b.	Taroo	**ni/ga*	totemo	hayaku	hasi-reru.
		Taro	DAT / NOM	very	fast	run-can
		'Taro can run very fast'.				

In (2)a, with a negative context, *ni*-marking is acceptable, and in fact, preferable to *ga*-marking.[3] In the affirmative counterpart (2)b, however, only *ga* is acceptable.

McGloin argues that a *ni*-marked NP in a negative context implicitly signals new or contrastive information and therefore *ni*-marking may be preferred even in the absence of another *ga*-marked NP. However, she does not provide any explanation as to why *ni* is used to mark contrastive or new information in the first place, nor what makes *ni* as acceptable as *ga* in some affirmative sentences like those in (1).

Thus, none of the previous analyses accounts for the full range of facts concerning the distribution of *ni*-marked subject NPs. They provide no explanation as to why in some cases both *ga* and *ni* are acceptable whereas one is more acceptable than the other elsewhere. Moreover, the previous studies fail to investigate the full range of verbs affected by this alternation, nor have they entertained the possibility that the alternation may in fact be attributable to complex interactions between the verb, different combinations of a set of co-occurring particles, and other morphosyntactic elements in the clause.

2. THE PRESENT STUDY. This section presents a cognitive analysis based on Langacker's role archetype model along with introspective evidence from a number of native speakers to support the analysis. I demonstrate that a host of factors ranging from extra-propositional elements such as auxiliaries, negative markers, modals, and adverbials actually affect the overall semantic construal of the event which, in turn, affects the clause's essential morphosyntax as indicated by choice of particles.

2.1. COGNITIVE ACCOUNT OF THE *GA/NI* ALTERNATION. In contrast to the claims by the previous Japanese scholars who have treated the particle alternation as syntactically or stylistically motivated, I argue that the *ga/ni* alternation can be interpreted as a semantic phenomenon reflecting the continuous nature of the AGENTIVE and EXPERIENCER roles. According to Langacker (1991a), the archetypal AGENT is a person who volitionally initiates physical activity resulting, through physical contact, in the transfer of energy to an external object. The archetypal EXPERIENCER, on the other hand, can be characterized as a sentient entity engaged in mental activity, be it intellectual, perceptual, or emotive. In Japanese, the AGENT is typically marked by the nominative case marker *ga*, as shown in (3)a and the EXPERIENCER by what is routinely called the dative case marker *ni* as shown in (3)b:

(3) a. Taroo *ga* Masaru o but-ta.
Taro NOM Masaru ACC hit-PAST
'Taro hit Masaru'.
b. Watasi *ni* wa Masao no gookaku ga totemo uresii.
I DAT TOP Masao GEN success NOM very happy
'I am very happy for Masao's success'.

The prototypical usages of these two particles, together with the accusative case marker *o* and the instrument marker *de*, can readily be mapped onto the four-square matrix associated with Langacker's (1991b) role archetype model, as shown in Figure 1.

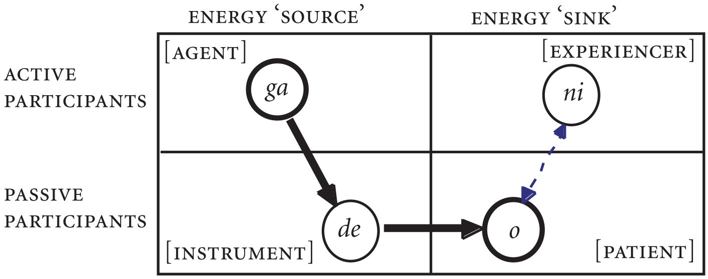

Figure 1.

This matrix describes the interaction of clausal participants using a metaphor of energy transmission (1991b:238–39). In this model, the four role archetypes are characterized in terms of two cognitive parameters, the 'energy flow hierarchy' and 'initiative hierarchy'. With respect to the former, a division is made between the energy-source domain and the energy-sink domain. AGENT and INSTRUMENT are higher on this hierarchy because they both can initiate energy transfer to another participant. With respect to the latter, the initiative hierarchy, on the other hand, the division is made between active and passive participants, where an active participant is that which is actively aware of or engaged in the activity or process rather than being passively involved or non-sentient.

This model allows us to capture the similarities as well as differences between the most typical types of clausal participants. Participants that are construed as residing in the active (i.e., initiative) sector of the matrix at the top are typically marked by *ga* and *ni*. Such participants are characterized by having the initiative capacity, and therefore share the property of 'sentience'. They differ from each other, however, in that *ga*, representing the highest rank in the energy flow hierarchy, codes both a volitional participant and an active one, properties typical of canonical AGENTS, whereas *ni*, located in the energy-sink or right-hand sector of the matrix, marks an EXPERIENCER, who lacks the AGENTS's volitionality or ability to initiate an activity or process. Similarly, *ni* and *o* share the characteristics of being in the downstream of the energy flow. They differ, however, in that *ni*, residing in the top sector, marks an active sentient participant while *o*, residing in the bottom sector of the matrix, marks a non-sentient, often inanimate, participant. The classic pair of causative sentences in (4) illustrate these characteristics:

(4) a. Taroo *ga* Masako *o* soko e ika-se-ta.
Taro NOM Masako ACC there DEST go-CAUS-PAST
'Taro made Masako go there'.

(4) b. Taroo *ga* Masako *ni* soko e ika-se-ta.
Taro NOM Masako DAT there DEST go-CAUS-PAST
'Taro let Masako go there'.

In both sentences (4)a and (4)b, the matrix subject *Taro* is marked by the nominative case marker *ga* as a volitional initiator. The two sentences differ from each other, however, in that in (4)a, with the accusative marker *o* marking the causee, it is implied that the subject *Taro* is indifferent as to whether *Masako* consents to go or not, i.e., *Masako* does not have any control over the situation. In (4)b, on the other hand, with the dative marker *ni*, which signals the property of sentient awareness, a property of an active participant, it is implied that *Masako* is willing to go, or even partially responsible for the caused event.

The model provides a schematic illustration of the *ga*/*ni* alternation phenomenon, which I argue is motivated by an essential ambiguity between the AGENTIVE and EXPERIENCER roles. That is, when the subject NP exhibits characteristics of a canonical AGENT, it is more likely to be marked by *ga*, and when it exhibits stronger characteristics of the prototypical EXPERIENCER, then it is more likely to be marked by *ni*. For example, as illustrated in (5), the same verb of comprehension, *wakaru* 'understand' may take either a *ga*-marked or a *ni*-marked subject, or both, depending on other aspects of clausal meaning:

(5) a. Taroo *ga*/*ni* Masako no kimoti o/ga wakaru.
Taro NOM/DAT Masako GEN feeling ACC/NOM understand
'Taro understands Masako's feeling'.

b. Taroo *ga*/**ni* Masako no kimoti o/*ga wakaroo-to-si-ta.
Taro NOM/DAT Masako GEN feeling ACC/NOM understand-CONJ.-try-PAST
'Taro tried to understand Masako's feeling'.

c. Taroo ?*ga*/*ni* Masako no kimoti *o/ga wakat-te-ki-ta.
Taro NOM/DAT Masako GEN feeling ACC/NOM understand-CONJ-come to-PAST
'Taro came to understand Masako's feeling'.

d. Taroo ?*ga*/*ni* (wa) Masako no kimoti *o/ga wakara-nai.
Taro NOM/DAT (TOP) Masako GEN feeling ACC/NOM understand-NEG
'Taro does not understand Masako's feeling at all'.

e. Taroo **ga*/*ni* (wa) Masako no kimoti *o/ga
Taro NOM/DAT (TOP) Masako GEN feeling ACC/NOM
mattaku wakara-nai.
at all understand-NEG
'Taro does not understand Masako's feeling at all'.

Both *ni* and *ga* are acceptable in (5)a, which describes a simple act of understanding. When other extra-propositional semantic elements are added to the clause, the construal of the subject participant changes, which has consequences for the felicity of either *ga* or *ni*. In (5)b, the auxiliary *tosita* 'tried to' describes a volitional act, and requires *ga*-marking. In (5)c, on the other hand, the inchoative auxiliary *tekita* 'came to' expresses some subjective event. The context is biased away from willful effort and *ni* is more acceptable. The same is true for (5)d; the inability expression *wakaranai* 'do not understand' suggests an irrealis event, thereby removing the subject NP from active control. In a context where negation is intensified by an adverbial, as shown in (5)e, moreover, the subject NP is completely void of intentionality, and only *ni* is acceptable.

2.2. A Survey Study. The survey reported here was conducted in the Kyoto Prefecture, Japan. 112 high school students participated on a voluntary basis. The purpose of the survey was to investigate what the acceptability of *ga*- and *ni*-marking can actually be attributed to in clauses of the type discussed in Section 1. In total 78 stimulus sentences were constructed with six different verbs, four transitive and two intransitive, in various semantic contexts, for example, 1sg. vs. 3 sg. subject, with the presence vs. absence of negative marker, and with or without certain auxiliaries and adverbials. They were presented in a randomized order, in each of which there were one (for intransitive sentences) or two blanks (transitive sentences) following the participant NPs, as shown in (6):

(6) a. TRANSITIVE SENTENCE
Hanako ____ furansugo ____ dekiru. ('Hanako can speak French'.)
1. *ga - o* 2. *ga - ga* 3. *ni - o*
4. *ni - ga* 5. *niwa - o* 6. *niwa - ga*
7. others ( )
b. INTRANSITIVE SENTENCE
Hanako ____ asa hayaku okireru. ('Hanako can get up early in the morning'.)
1. *ga* 2. *ni* 3. *niwa* 4. others ( )

Subjects were asked to fill in the blanks by choosing a particle or a pair of particles. They were instructed to choose 'others' only when none of the alternatives was acceptable. The collected data were pooled into tables and were subject to chi-square analyses. Data from three subjects had to be eliminated because they did not follow the instruction. It should also be noted that for the purpose of this study, responses for *niwa* were combined with those for *ni* in order to exclude discourse factors.

The data indicated that semantic factors such as volitionality, negativity, and inchoativity, actually did influence subjects' particle choice. Table 1 shows the

	STIMULUS SENTENCE	CONDITION	*ni*	*ga*	others
a	Watasi ___ kareno kimoti (o/*ga*) wakatta. ‘I understood his feelings’.	NEUTRAL	79	3	27
b	Watasi___kareno kimoti (o/*ga*) wakarootoshita. ‘I tried to understand his feelings’.	VOLITIONAL	2	25	82
c	Watasi ___ kareno kimoti (o/*ga*) wakattekita. ‘I came to understand his feelings’.	INCHOATIVE	66	2	41
d	Watasi___kareno kimoti (o/*ga*) wakaranakatta. ‘I did not understand his feelings’.	NEGATIVE	90	1	18
e	Watasi ___ kareno kimoti (o/*ga*) doositemo wakaranakatta. ‘I did not understand his feelings by any means’.	NEGATIVE/ INTENSIFIER	100	0	9
					(N=109)

Table 1.

obtained raw scores for five different types of semantic modifications with the verb *wakaru* ‘understand’. The totals reflect the number of subjects who chose the particular particle.

A chi-square test revealed that the frequency distribution is significantly different across the various semantic conditions, χ^2 (8, N=109)=257.42, $p < .01$. In particular, with the presence of volitionality in (b), the particle choice was found to be significantly different from that for the neutral sentence in (a), χ^2(2,N=109)= 118.24, $p < .01$, as was the case with the intensified negativity in (e), χ^2(2, N=109)= 14.46, $p < .01$.

Similar frequency distribution patterns were observed for the other sets of stimuli with different verbs. Table 2 is a summary of the data for the sets of sentences with the other three transitive verbs, *mieru* ‘can see,’ *dekiru* ‘be able,’ and *hanaseru* ‘can speak’.

	mieru ‘can see’			*dekiru* ‘be able’			*hanaseru* ‘can speak’		
SEMANTIC CONDITION	*ni*	*ga*	others	*ni*	*ga*	others	*ni*	*ga*	others
NEUTRAL	81	1	27	41	5	63	22	11	76
INTENSIFIED ADV.	76	1	32	25	6	78	34	7	68
NEGATIVE	80	0	29	37	1	71	52	3	54
INTENSIFIED NEG.	97	0	12	46	2	61	58	4	47
χ^2	14.29*			13.97*			34.40**		

*p<.05 **p<.01

Table 2.

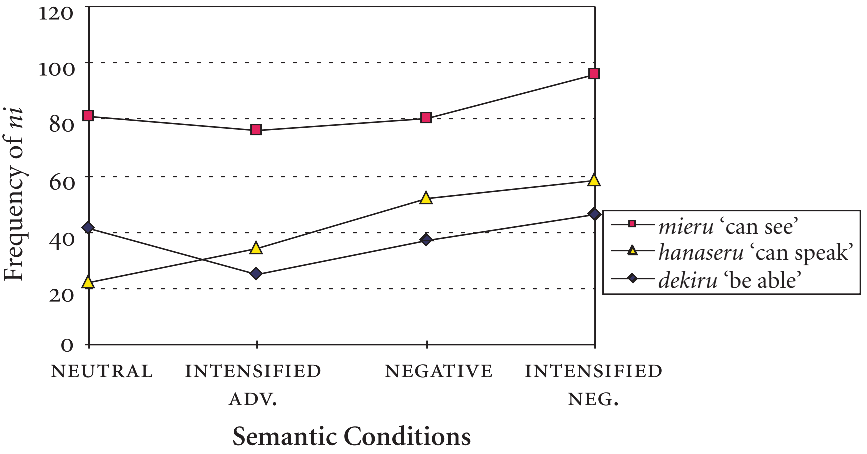

Figure 2.

The differences in frequency of preference for *ni* vs. *ga* among the various semantic conditions were found to be significant for all the transitive verbs tested in the survey. Figure 2 illustrates the interaction between the acceptability of the particle *ni* and the various semantic contexts for the three transitive verbs. *Ni* is more acceptable in the presence of negativity, which describes an irrealis event and therefore biases the context away from volitionality or intentionality. The acceptability of *ni* increases in the context where negation is intensified with an adverb.

It was suggested that verb types may affect particle choice. For the neutral semantic condition, the frequency distribution was found to be significantly different across different verbs, $\chi^2(4, N=109)=93.42$, $p<.01$. *Ni* was more acceptable in contexts with the verb *mieru* 'can see' and less in those with the verbs *hanaseru* 'can speak' and *dekiru* 'be able'. These results may not be surprising at all when one considers the verb meanings. They differ from each other in the intentionality or volitionality associated with the activities. While *mieru* describes one's visual ability, which cannot be controlled intentionally, *hanaseru* and *dekiru* describe ability of speaking a language, which is most likely associated with one's effort or active endeavor.

Similarly, the data suggested that the object NPs also affect particle choice. For the same verb *wakaru* 'understand,' *ni* was found more acceptable across semantic contexts when the verb takes an abstract noun *kareno kimoti* 'his feelings' than when it takes a more concrete noun *doitugo* 'German language'. Chi-square tests revealed that the frequency distribution between the two types of object nouns was significantly different, e.g., $\chi^2(2, N=109)=25.09$, $p <.01$, for neutral contexts, and $\chi^2(2, N=109)=17.43$, $p<.01$, for negative contexts. These results can be interpreted as reflecting differences in subjectivity. In understanding somebody's feeling, one

SEMANTIC CONDITION	*hanaseru* 'can speak'			*hasireru* 'can run'			*okireru* 'can get up'		
	ni	*ga*	others	*ni*	*ga*	others	*ni*	*ga*	others
NEUTRAL	2	7	100	4	14	91	9	8	92
INTENSIFIED ADV.	16	7	86	10	17	82	15	7	87
NEGATIVE	30	3	76	24	5	80	30	2	77
INTENSIFIED NEG.	49	5	55	36	1	72	48	2	59
χ^2	65.40**		53.95**	50.21**					

**p<.01

Table 3.

undergoes emotional or psychological change, and therefore the subject is more experiencer-like and best marked by *ni*. Understanding a language, by contrast, describes a more objective and less intra-personal ability, and *ni* is less acceptable.

Moreover, it was indicated that the particle alternation phenomenon is not restricted to transitive verbs, as argued in the previous literature. Table 3 shows frequency distributions for three intransitive verbs across the various semantic conditions.

The differences in frequency distribution were found to be significant for all the verbs tested in the survey. As illustrated by the graph in Figure 3, all three verbs exhibit a similar pattern of interaction between the acceptability of *ni* and semantic conditions. While *ni* is generally unacceptable in a neutral context, its acceptability increases in an affirmative sentence with an intensified adverb. Moreover, the

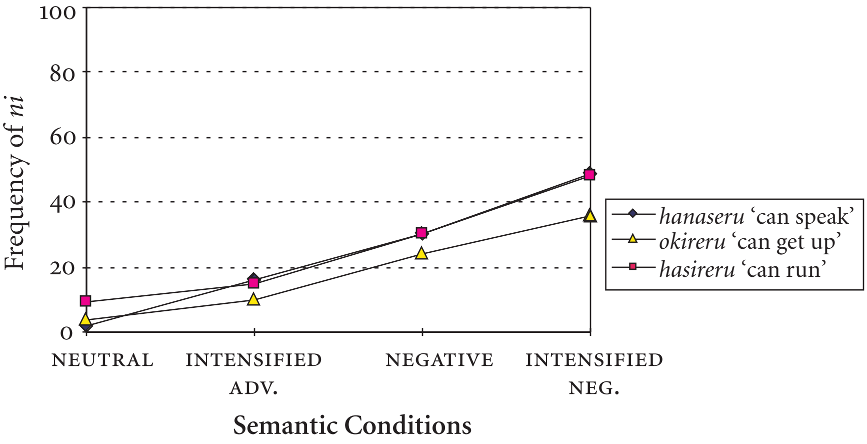

Figure 3.

presence of negation and a negative intensifier biases the context further away from intentionality or volitionality, thus *ni* is more acceptable.

The other two semantic factors of interest in the study, the subject noun type (1st vs. 3rd singular person), and tense (present vs. past), failed to yield significant results, and will not be discussed further.

2.3. SUMMARY. The results suggest that particle choice is indeed affected by a variety of semantic factors, among which are extra-propositional elements, such as negativity, volitionality, and inchoativity, as well as verb type, and object noun type. In contrast to analyses by previous Japanese scholars who have attributed the *ga/ni* alternation to a narrower set of stylistic or syntactic variables affecting transitive verbs only, I found similar patterns of interactions between semantic elements and the particle alternation for both transitive and intransitive verbs. I also found that the acceptability of the particular particle is a matter of degree and not a categorical phenomenon.

These findings are consonant with Langacker's role archetypal model illustrated in Figure 1. The AGENTIVE and EXPERIENCER roles can be understood as being endpoints on a complex semantic cline, a cline of volitionality, just as *ni* and o are on a cline of sentience, as reflected in the causative alternation given in (4). The model predicts the possibility that *ni* and *ga* alternate, as do *ni* and *o*, but not *ni* and *de*. These two conceptual categories, AGENT and EXPERIENCER, share many features in common. Although there is considerable overlap between them, they do reflect quite distinct types of event participants. Their morphological correlates in Japanese, *ga*- or *ni*-marking of an NP, likewise sometimes overlap and sometimes remain quite distinct. Consequently, *ga* and *ni* marking is sometimes in complementary distribution and sometimes in apparent free variation within certain Japanese clauses, reflecting the continuous nature of the semantic content of the AGENTIVE and EXPERIENCER roles.

My findings are also consistent with Nishimura (1993), who has claimed that differences between semantic roles may be ambiguous, and the notion of AGENTIVITY is a matter of degree. He has argued that while the prototypical AGENT can be characterized as being the 'intender' and 'actor,' the notions of 'control' and 'responsibility' are crucially involved in the definition of noncentral AGENTS (1993:516–19). Rice (1987) has also pointed out that a substantial number of conceptual factors contribute to agentivity, a component of transitivity, all of which can be identified as facets of the canonical event model. However, these factors or facets can be overridden in certain contexts and the construal of an event participant is never an all-or-nothing thing.

3. CONCLUSION. In this paper, I have provided yet another piece of evidence to support claims made by many cognitive linguists that grammatical categories, including case markers, are meaningful (e.g., Lakoff 1987, Langacker 1992, Rice 1996), and

that meaning is distributed, rather than localized, in such a way that grammatical constructions or templates as a whole are meaningful (e.g., Goldberg 1995). Moreover, the continuous nature of semantic roles demonstrated by the apparent particle alternation studied here suggests that human categorization is non-criterial, continuous and organized around prototypes, thus further supporting the assumption made by cognitive linguistics that linguistic form reflects conceptualization even in such cases where the forms themselves are not attributed much, if any, meaning.

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[1] I thank Sally Rice for her helpful comments on this paper. I am also grateful to my brother-in-law, Shigenori Tanaka, for allowing me to conduct the survey during his classes, and to his students for their participation

[2] The abbreviations used for the glosses are as follows:

ACC	accusative	DAT	dative	NOM	nominative
CAUS	causative	DEST	destinational	TOP	topicalizer
CL	classifier	GEN	genitive	PAST	past tense
CONJ	conjunctive particle	NEG	negative		

[3] *Niwa* is a form in which *ni* is combined with the topicalizer *wa*. Some sentences in Japanese may favor one over the other, and some can take them almost interchangeably. While I recognize the significance of the difference between the two forms, their difference is mainly attributable to a discourse factor and is beyond the scope of this paper. For simplicity, I will treat *niwa* as being semantically equivalent to *ni*.

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VIII. HISTORICAL STUDIES

THE IDIOMATIZATION AND GRAMMATICALIZATION OF COMPLEX PREPOSITIONS

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The aim of the present paper[1] is to trace the development of complex prepositions, such as *on account of*, *for want of* and *by reason of*,[2] from the 15th to the 19th centuries and to argue for the processes of their grammaticalization and idiomatization.

As regards the internal structure of complex prepositions, a variety of prepositions may occupy the first position, e.g., *in* (***in** addtion to*), *by* (***by** reason of*), *for* (***for** want of*), *on* (***on** account of*), *with* (***with** respect to*), as well as the final position, e.g., *of* (*in spite **of***), *to* (*with regard **to***), *with* (*in common **with***). While the noun most often has a zero determiner, the definite article (e.g., *for **the** sake of*) is not infrequent; the indefinite article is rare. More discussion of this will be given in later sections.

To date there is not much literature in this area. Quirk and Mulholland (1964) discuss complex prepositions in present-day English. Schwenter and Traugott (1995) investigate three complex prepositions expressing substitution: *instead of*, *in place of*, and *in lieu of* in relation to historical pragmatics. Finally Brinton and Akimoto (1999) discuss the topic with particular reference to 18th century English.

1.The Data. I collected examples of complex prepositions from texts consisting of approximately 60,000 words. Five texts from each century were taken for this purpose. I kept the variety of genres in mind: i.e., fiction, drama, essays and letters. The texts are listed at the end of this paper. As is discussed later, the occurrences of complex prepositions differ greatly from genre to genre. There are very few examples in drama texts, while many examples are found in essays dealing with economy and philosophy. With respect to periods, the 18th century saw a rapid increase in these phrases. In what follows, titles and pages are indicated in parentheses after examples.

2. Grammaticalization, Idiomatization and Lexicalization. The processes involved in the development of complex prepositions may be variously considered from the perspective of grammaticalization, idiomatization and lexicalization.

Grammaticalization has been extensively discussed in recent years.[3] It is the process by which a lexical item becomes a fully grammaticalized item, or a less grammaticalized item becomes a more grammaticalized item. Grammaticalization often involves 'decategorialization', or loss of the morphological and syntactic attributes that characterize a word as belonging to a particular class.[4] Morphologically, there is movement from independence to boundedness. The choice of forms in a particular construction narrows, generally with one form becoming obligatory; the form undergoing grammaticalization loses syntactic variability, occupying a fixed syntactic slot. Semantically, grammaticalization often invloves 'bleaching', weakening, or loss of meaning, with a movement from concrete to abstract. More recently, it has been argued that grammaticalization always involves an increase in subjective meaning (Schwenter &Traugott 1995).

Idiomatization can be discussed as 'the process of finding the pattern and assigning a new meaning which cannot be deduced from the constituents' (Akimoto 1995:588). Morphosyntactically, idiomatization involves decategorialization of nouns. Semantically, it is accompanied by the change from concrete to abstract. Furthermore, reanalysis[5] resulting mainly from a combination of these factors takes place to make an integrated form.

Lexicalization can refer to a number of different phenomena. In the broadest sense, lexicalization is 'the process by which material develops into or is recruited to form lexical items' (Hopper & Traugott 1993:224). In relation to grammaticalization and idiomatization, Lipka (1990:97) considers idiomatization as part of lexicalization, saying 'lexicalization is a gradual, historical process, involving phonological and semantic changes and the loss of motivation'. Lexicalization involves gradual reduction, demotivation, fossilization and conventionalization (Wischer 1997), as in the case of grammaticalization and idiomatization. Reanalysis operates in all these three processes. Quirk et al. (1985:1530) give *lose sight of* and *in aid of* as examples of phrasal lexicalization, admitting the gradience between grammar and lexicon, including a gradience in lexicalization.

On the basis of the discussion given above, the change in complex prepositions, such as loss of the definite article, involves grammaticalization in that the noun between prepositions loses its noun status, which results in prepositional phrases which retain their nominal meaning. The change also concerns idiomatization in that the noun used in phrases often loses its meaning and obtains an idiomatic meaning: i.e., *on account of* = *because of*, *with regard to* = *concerning*. Another characteristic of these phrases is the fossilization of forms, prevalent in lexicalization, although there is flexibility of forms before they become idiomatic phrases.

3. THE DEVELOPMENT OF COMPLEX PREPOSITIONS. One reason for choosing the 15th century for the starting point is due to the fact that the formation of complex prepositions began to increase from that period onwards. As an approximation, I selected 150 complex prepositions from *The Oxford English learner's dictionary of current English* (1990) and checked their first citations in *The Oxford English dictionary*. Table 1 shows the result of this checking.

Century	Number of complex prepositions first cited
1200–1300	3
1300–1400	11
1400–1500	13
1500-1600	23
1600–1700	36
1700–1800	34
1800–1900	30
1900–	0

Table 1. Numbers of first citations in each century

	15th Century					**16th Century**				
	PL	**Mal**	**Blan**	**Don**	**Kem**	**Del**	**Sid**	**Nas**	**EF**	**Ely**
token	44	34	26	21	19	47	43	39	34	19
type	19	21	20	7	14	29	26	27	20	12

	17th Century					**18th Century**					**19th Century**				
	Bun	**Lev**	**But**	**Pep**	**Dry**	**Sm**	**Smol**	**Bur**	**Ch**	**Far**	**Mil**	**Qu**	**Aus**	**Dar**	**Wil**
token	62	41	30	28	26	125	100	96	71	19	97	71	63	48	42
type	27	22	25	20	23	22	64	52	40	15	48	56	33	16	25

Table 2. Frequency of complex prepositions from the 15th to the 19th centuries.

In comparison, I present the frequencies of complex prepositions in each work in each century. As Table 2 shows, they increase over time.

In Table 3, I give some complex prepositions which occur most frequently in each century. One conspicuous point with these phrases is that the '*in*+NP+*of*' pattern (*in consequence of*) has been constantly productive. As a matter of fact, one third of the 150 examples given before belong to this pattern.[6] Other patterns such as '*by*+NP+*of*', '*on*+NP+*of*' and '*for*+NP+*of*' are frequent. It is of interest to note that kinds of 'P1+NP+P2' patterns differ from century to century.

Authors also vary in their preferences for complex prepositions. Adam Smith, for instance, uses *in proportion to* very frequently, and Charles Darwin favours the use of *in the case of*. In this respect, the table shows skewed frequencies. The following are some representative examples of each century.

(1) …he chargyd þis [creatur] *be vertu of* obedyens to tellyn hym… (Kempe:50)

(2) …as long as they had but one bishop which was their ruler, and was *in the stead of* a prince at that day… (Elyot:9)

(3) Now the way from the River was rough, and their feet tender by *reason of* their travels… (Bunyan:149)

(4) But this superiority of produce is seldom much more than *in proportion* to the superiority of labour and expense. (Smith:111)

(5) Elizabeth, *for the sake of* saying something that might turn her mother's thoughts, now asked… (Austen:38)

The following points are particularly interesting in relation to Table 3:

(a) Those complex prepositions with the definite article lost the article in many instances: e.g., *by (the) means of*, *by (the) virtue of*, and *in (the) stead of*.
(b) While there are differences in frequencies in each century, *in stead of* has been in continuous use throughout the centuries.
(c) The 18th century saw the rapid increase of use of complex prepositions. Why should this be so?

I will analyze *instead of* and *on account of* as representative examples of the P1+NP+P2 pattern.

15th Century		**17th Century**		**19th Century**	
by (the) virtue of	14	instead of	18	instead of	22
in (the) stead of	11	by reason of	18	for the sake of	21
by (the) means of	10	for want of	13	in spite of	19
in (the) presence of	8	in order to (NP)	6	in the case of	15
by force of	6	for fear of	5	in regard to	13
by cause of	5			in front of	11
upon pain of	5	**18th Century**		for the purpose of	9
		in proportion to	38	with respect to	8
16th Century		on (the) account of	27	in consequence of	6
in (the) stead of	27	with regard to	20		
by reason of	12	instead of	19		
for want of	8	in consequence of	18		
in the presence of	6	in favour of	17		
for fear of	5	for the sake of	13		
in comparison of	5	at the expense of	13		

Table 3. Frequencies of complex prepositions from the 15th to the 19th centuries.

	Century					
instead of +	15th	16th	17th	18th	19th	20th
N	6	23	2	9	6	140
pro	4	2	8	0	2	2
ing	1	2	7	10	10	137
whereof			1			
adj(+N)					2	1
pro(+N)					1	1
prep+N					1	8
other						11
head position	0	2	0	6	5	

Table 4. *Instead of* constructions.

4. *INSTEAD OF*. Schwenter and Traugott (1995) discuss the development of *instead of*. They trace its substitutive construction during the periods of Old English, Middle English and Early Modern English. In the course of its grammaticalization, *instead of* came to be used with gerunds. It, together with its NP object, became fronted in the sentence. Its syntactic generalization has spread to tensed verbs in present-day English, as in (6).

(6) I can sing *instead of* dance. (Thompson 1972:247, cited in Schwenter & Traugott 1995:252)

I examined the development of *instead of* together with elements after *of*. Table 4 shows these results. Gerunds became gradually more frequent and, in the 19th century, 'adjective (+NP)' and 'preposition+NP' constructions appeared along with gerunds after *instead of*. The trend from the 19th century continued into the 20th century.To illustrate this trend, I randomly selected 300 examples of *instead of* from the Birmingham COBUILD data, which are shown in Table 4.

(7) And feerþirmore, as we ouȝte forto not putte god, or his name taken *in stide* of him… (Donet:127)

(8) …coming unto this stately beast with this imperious message, *instead of* doing homage unto him… (Nashe:122)

(9) The word Person is latine: *instead* where*of* the Greeks have… (Hobbes:217)

(10) *Instead of* waiting indolently in their workhouses, for the calls of their customers, as in Europe, they… (Smith:174)

(11) It is fortunate, then, that they fall to my lot *instead of* to yours. (Austen:41)

The OED cites an example of *instead* from 1667 (Milton), although I did not encounter this in my data.

5. *ON ACCOUNT OF*. The OED defines the phrase *on account of* as follows:

a. 'In consideration of, for the sake of, by reason of, because of'.
1647 J. SALTMARSH *Sparkles of Glory* (1847) 86 Upon this account these offices have been thought ordinary which were *upon the mere and pure account of* the Holy Ghost.

b. 'In the matter of, with regard to, concerning'. Obs.
1749 FIELDING *Tom Jones* (1840) XIII.iv.190 I am satisfied *on the account of* my cousin.

Although Table 2 does not reveal any occurrence of *on (the) account of*, we can detect some examples of the form with the definite article from the 17th century onwards, by extending the data sample. The following are some examples.

(12) For the Reformation was introduced *upon the Account of* Reason. (Butler:188)

(13) …that his coming here (which by the way is put off until Christmas, *upon the account of* the ill news of his Governor) had already given an alarm which would be very much increased… (Chesterfield:3)

On account of increasingly occurs in sentence initial position as time goes on. Table 5, based on the OED CD-ROM, shows the change in position of *on account of* from the 18th to the 20th centuries. Due to space limitations, no examples are given.

The Modern English meaning 'because of' seems to become stronger, with the frequent initial position of *on account of*. Consequently, the change of meaning takes place as follows: *in consideration of* → *concerning* → *because of*.

	frequency	sentence initial
18th Century	156	1 (0.6%)
19th Century	446	14 (0.3%)
20th Century	228	28 (12%)

Table 5. Sentence initial position of *on account of*.

6. Conclusion. In this paper, I have emphasized the processes of idiomatization together with grammaticalization through the analysis of complex prepositions with a concentration on the analysis of *instead of* and *on account of*. It is necessary that linguistic change should take idiomatization phenomena into account.

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[1] I am grateful to Peter Robinson for reading an earlier version of this paper.

[2] Following Quirk et al. (1985:669–71), we call the sequences of P1+NP+P2 complex prepositions.

3 See, for example, Heine et al. (1991), Traugott and Heine (1991), Hopper and Traugott (1993), Pagliuca (1994) and Brinton (1996).

[4] Hopper (1991) puts forward five principles of grammaticization: layering, divergence, specialization, persistence and decategorialization.

[5] For further discussion, see Lightfoot (1979:98–115), Brinton (1988:102–03), Traugott and Heine (1991:167–70), Denison (1993:passim), and Hopper and Traugott (1993:61–2).

[6] Quirk and Mulholland (1964:66) mention the frequent occurrence of *in* _____ *of* occupying more than one third of the total examples they analyzed.

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◆

A WEE DRAM OF THE CREATURE: EXAMINING THE SEMANTIC LINK BETWEEN 'ANIMAL' AND 'ALCOHOL'

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When faced with the idiomatic expression[1] contained in the above title, one cannot help but wonder what might have originated the well-known metaphorical association that exists in English between the term *creature* and its reference to alcohol. Metaphorical associations often arise when a functional iconicity is perceived between two or more items (Anttila 1989). Indeed, the creation of metaphors is one of the means by which human beings exploit their innate capacity to analogize (Pinker 1994), and semantic transfer through a similarity of sense perception is perhaps the most important analogical process evidenced by all languages. To shed light on the query stated above, then, we must look to possible analogical processes that could have given rise to the two sememes' linkage. In fact, in such an investigation, we must be aware that, in addition to physiological perceptual mechanisms, a semantic transfer also rests on cultural and social factors (Lakoff 1979). This caveat is particularly true in the formation of metaphors which, because of their predominantly iconic nature, disclose the speaker's view of the world.

This paper proposes to examine some of the cultural perceptual links that may underlie both the idiomatic expression: *a wee dram of the creature* and that of similar others which are now largely confined to Irish usage. It is hoped that in the process it will become evident that the semantic transfer from *creature* to alcohol is not confined to cultural elements specific to Ireland. Indeed, the perception of alcohol as a living entity arises from its chemical properties and is therefore a concept that may be common to a number of other cultures as well.

1. Homophony. The English word *creature* 'a thing created' dates back to the Middle English period when it entered the English lexicon from Old French.[2] The Old French term *créature* had, in turn, derived from the Liturgical Latin word *creātūra*. The Latin stem, *creāre* 'to make', can be traced back to the Proto-Indo-European root **ker₁-* [IEW 577] 'to grow'.

A cursory look at some of the earliest English textual attestations reveals a diversity of rather interesting spellings that hint at the loan word's adaptation to the phonology of English dialects. Among these are the spellings *cratur*, *crater*, *crathur*, all of which are generally ascribed to 'Irish' pronunciation (see section 4 below).

1.1 The Creature. By Chaucer's time (c. 1343–1400), the loan word also held the semantic category [+animate] as is shown conclusively by the poet's frequent use of the term in his works. In fact, judging by its frequency of occurrence in the poetry of Chaucer, we know that it was also one of his favorite words. As an example, in *The Canterbury tales*, the word *creature* occurs no less than forty-four times; in *Troilus and Criseyde*, no less than twenty-five times. Because *The Canterbury tales* were, for the most part, written in decasyllabic couplets, we are able to count syllables, and determine with a high degree of probability that, at the time this work was written (c. 1387–1400), *creature* was still trisyllabic.[3]

Further, because there are so many occurrences of *creature* in *The Canterbury tales*, most of them in rhyming position, we can come up with some general indications of how it was pronounced in Chaucer's day.[4] Thus, based on a necessary assumption that Chaucer's spelling was largely phonemic, and on our knowledge of vowel pronunciations during this period of the Great English Vowel Shift, we can assume with a fair amount of confidence, that *creature* was pronounced much the same way during Chaucer's lifetime as it was in the original Old French, namely /'kreatur/.

By Shakespeare's time, however, the situation had begun to change. According to Helge Kökeritz (1953:293), *creature* is still trisyllabic in two places in Shakespeare's writings: *King Henry IV* I.6.4 and *Pericles* 3.2.104. Kökeritz further cites Butler's *English grammar* (1634:55) as supporting evidence of this trisyllabic value. Though it must be pointed out that he is doing so within the context of illustrating the anaptyxis of [ə], where *creature* becomes */kə'retur/*.

Wilhelm Viëtor further indicates that *creature* was already mostly disyllabic during the bard's time and was pronounced /'kre:tiur/ (Viëtor 1906 [republished 1963]:167). Indeed, Shakespeare's poetry bears out Viëtor's claim. In *Venus and Adonis* (1593), which is written in decasyllabic meter, the term *creature* occurs frequently, and always as a two-syllable word. Furthermore, in Shakespeare's sonnets, all of which were written in iambic pentameter, there are two more instances, both of which must be disyllabic in order to preserve meter. Most significantly, in Sonnet CXIII, Shakespeare rhymes the entire word with *feature*, a word whose disyllabic quality has never been in dispute (cf. Kökeritz 1953:106, 175, 198, 270; and Viëtor 1906:167). Yet, one must bear in mind that poets may, and often have altered pronunciations to fit their purposes.[5]

1.2 *Crater*. The alternative spellings of *creature*: *cratur*, *crater* and *crathur* of Irish sources seem to point to a possible homonym or near-homonym within Irish pronunciation with another loan word, namely *crater* 'mixing vessel'. This latter form is a reflex of a different PIE root **ker(ə)*$_2$-[IEW582] 'to mix, cook' which has not only a similar phonemic shape, but may share a peripherally common semantic field with the former.[6] Reflexes of the PIE root **ker(ə)*$_2$- 'to mix' are realized in Greek as ϰεϱα-, ϰϱα- 'to mix', from which we recover the etymon ϰϱάτήϱ 'mixing vessel'.

This word was subsequently borrowed into Latin as *crātēr* 'a mixing bowl usually used for wine' (*Oxford Latin dictionary* 1982), and then later on into English. As in the case of the loan word *creature*, the English definitions for the loan word *crater* remained largely unchanged from the original Latin as well.

Fortunately, from the seemingly more consistent spelling, the pronunciation of *crater* is much easier to determine. Coming from the Vulgar Latin *cratēr*, we can assume that its original English pronunciation was much the same, and that the stress was already on the initial syllable. As for the quality of the vowel in the first syllable, if we examine the shift in pronunciation that *crater* underwent during the Great English Vowel Shift period, and then compare it to the first vowel in *creature*, it becomes plain that a strong chance of near-homophony arose between these two words during the 17th through the 19th century. This overlap can be shown as follows (adapted from Anttila 1989:65):

Vowel	15th c.	17th c.	19th c.	20th c.
ea in creature	ǣ	ē	ī	ī
a in crater	a	ǣ	e	ei

Because of their status as loan words, then, the chances are highly unlikely, but not impossible, that overlap occurred between their vowel sounds during the time period spanning the 15th and 17th centuries. But by the dawning of the 17th century, the same claim of unlikelihood cannot be made, as the pronunciation data from Shakespeare indicates. In fact, during the time frame in which an overlap may have occurred in the environments of the initial vowels, the two words most likely would have been pronounced identically according to Kökeritz's pronunciation (1953:173, 194-201, 261, 271). Using Viëtor's data, in fact, they would have been distinguished by the palatalized /t/ and following vowel in one set of pronunciations, but in another, they would have been identical as well (Viëtor 1963:45). Although Viëtor makes sparing use of the schwa in his analysis, it would be more appropriate to use it in the non-palatalized unaccented syllables, so his pronunciations may be modified accordingly.

	Kökeritz	**Viëtor**
creature	*/kre:tər/*	*/kre:tiur/, /kre:tər/*
crater	*/kre:tər/*	*/kre:ter/, /kre:tər/*

2. Metonymy. Attestations of the expression *the creature* to indicate 'alcoholic beverage' date back to the late 16th century. In *The Debate betweene pride and lowlines*, by F.T. (OED ascribed to Fr. Thynn, c 1570), the author writes, 'The creature [wine] of the proper kinde Was good, though use offenden therewithall' (brackets his). Thirty-four years later, Shakespeare immortalized the reference in *Othello*, II. iii. 313: 'Come, come, good wine is a good familiar creature, if it be well used'. The evi-

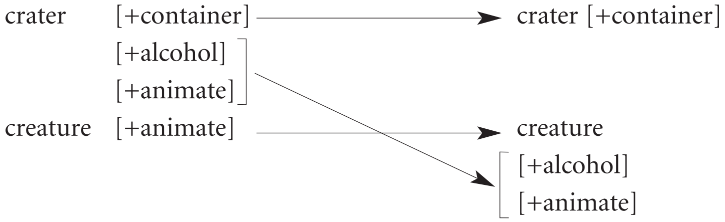
dence is clear, then, that the *creature* was being used as a metaphor for wine as early as Elizabethan times. But where did this metaphorical relationship come from?

The use of metonymy to describe habitual activities is well documented. Indeed, through the indexical force of synecdoche, the semantic transfer from parts to signify wholes, *cars* become *wheels*, one *rides* the *rails* when traveling by *train* and a *glass* can mean a *serving of wine*. Metonymy and ellipsis interlock extensively so that *the bottle* can refer to its alcoholic contents just like a *fifth* stands for a fifth-gallon of hard liquor, and in modern American English vernacular, a *keg* means a whole lot of beer. Thus, given that craters were used as containers for large quantities of liquids, specifically alcoholic beverages, and because of this function they were no doubt essential (and popular) items at social gatherings, it would seem highly likely that some sort of metonymy or ellipsis might have arisen due to their use and function. While the exact form that this semantic transfer might have taken is unknown, certain inferences can be made.

In English, a metonym such as *the bottle* is used typically when indicating that an unspecified portion of its contents is being or has been consumed. For instance, 'He's been hitting the bottle again' means that the person in question has been drinking an unspecified amount of alcoholic beverages, most likely those of the distilled variety. There is nothing about this usage, however, to indicate that the person in question has finished the bottle's contents. One can just as easily say, 'He's been tapping the keg again' or 'He's dipping from the punch bowl again', either of which will carry essentially the same meaning, with the implication being even more obvious that the contents are not consumed entirely within the context of the statement. If it is understood, then, that the container's supply of libation is not yet exhausted, it would be inappropriate to ask for another container, but not at all inappropriate to ask for more from the same one.

Thus the use of the definite article would be expected in English. In view of this, then, whatever the sort of specific metonymic references that may have existed concerning craters and alcohol, it is likely that these references would have been to *the* crater, just as we see references to *the* bottle, *the* keg, or *the* punch bowl.

At this point, two things are apparent: that metonymy most likely existed between *crater* and *wine*, and that homophony—or near-homophony—quite probably existed between *creature* and *crater*. Consequently, we have sufficient conditions to infer that a semantic transference could have occurred between *creature* and *crater*; but are they *necessary* conditions? Absolutely not. Bearing in mind that semantics is the fundamental force that allows language to function as a system of communication and representation, and that, first and foremost, the purpose of language is to communicate meaning, and further, that occurrences of homophony may destabilize the system's balance, we would not expect any transference to occur between the two forms unless some sort of semantic overlap already existed. We have seen how, in some environments, a primary semantic split could have occurred quite easily, where the original association was transferred via semiosis to a new term due to the emergence of the shared semantic category [+animate] and the occurrence of near or total homophony. The result would have been an old term, *creature*, with a new semantic category: [+alcohol]. The situation may be illustrated as follows:



At this point, a more in depth look seems to be required of the semantic features shared by the terms *creature* and *crater*; we turn therefore to the investigation of this common element, namely, alcohol.

3. The properties of alcohol. It was not until after the medieval art of alchemy arose that alcohol was successfully isolated, and thereby quantified. The word *alcohol* comes from the Arabic *al koh’l* ‘antimony powder’ (OED 1989:209). Powdered antimony is characterized by an extremely fine consistency and was used as a cosmetic by Arab women, in much the same way as modern women use eyeshadow or eyeliner. When the Europeans first borrowed the word, it was used as a term for any extremely fine substance. Later, it came to be used as a term for any fine solid substance produced by means of friction, pulverization, or sublimation, especially the latter. Due to observed similarities between the sublimation and distillation processes, medieval alchemists began to associate the term *alcohol* with distillation as well. Alcohol by fermentation is a natural process and even before the advent of medieval alchemy, alcohol could be concentrated in the northern countries simply by fractional freezing. This process was, of course, not as efficient as distillation, but technologically it was a lot more accessible. In any event, by the late 16th century, the term *alcohol* came to mean a specific class of products of distillation that were observed to ‘cook off’ as vapors (i.e., going from a liquid to a gaseous state) before the solution in which they resided came to a boil. These vapors of distillation also became known as ‘spirits’ (from the Latin *spiritus* ‘breath’), a term for distilled alcohol which is still in common use.

From its earliest occurrences in English (circa mid-13th century), the term *spirit* has been used to refer to a physical being’s life force or essence, i.e., ‘the breath of life’ (cf. *whiskey* < *whiskybae*, is an anglicized version of *usquebaugh*, a compound of Gaelic *uisge* ‘water’ and *beatha* ‘life’). By the early 14th century the term *spirit* was being used to refer to supernatural or incorporeal beings. Accordingly, the multiple meanings inherent in the term *spirits* may have further added to the perception of alcohol having animate properties. The art of alchemy itself perhaps lent credence to this view. Alchemists were frequently said to be magicians and sorcerers, some of them kept spirits, such as imps, fairies, gnomes, etc., trapped to do their bidding. In fact, one of these types of trapped spirits was known as a 'bottle imp', and the well-known Swiss alchemist, Paracelsus (1493–1541), was widely believed to have kept an imp trapped in the crystal pommel of his sword. To this day, one can purchase from a London magician's supply apparently empty *wine bottles* that are sealed with red wax and bear runic inscriptions, but which are said to contain imps of the bottled variety (Cavendish 1983:1417).

4. THE CREATURE ← 'BOUNTY OF THE EARTH' LINK. The biblical verse 1 Timothy 4:4 states: 'for every creature of God is good, and nothing to be refused, if it be received with thanksgiving' (King James Version). This verse has been interpreted to mean that all of God's creation, *including food, drink, and various other 'comforts'*, is inherently good because God made it, and further, that one should feel free to indulge provided that proper thanks is given (OED, 1st ed.; Brewer 1870). Thus, we see (sampling from the OED):

- 1614 Bp. Hall *Recoll. Treat.* 197 Those that come to their meate as to a medicine… shall be sure not to joy too much in the creature.
- 1658 *Whole Duty Man* viii. 12. 72 Waste… of the good creatures of God.
- 1756 C. Lucas *Ess. Waters* I. 170 Tea, snuff, and many other useful creatures.
- 1765 T. Hutchunson *Hist. Col. Mass. Bay* I. 107 The good creature tobacco.
- 1821 Lamb Elia, *Grace before Meat*, We were put to it to reconcile the phrase 'good creatures', upon which the blessings rested, with the fare set before us.

As most of the above references indicate, various items became not just creatures, but *good* creatures. And so did wine, as was indicated in the quotes at the beginning of this paper where F. T. refers to the 'creature of the proper kind [being] good', and Shakespeare writes 'good wine is a good familiar creature'. In fact, wine, beer, ale, stout, and the like were considered food and it was not until the 18th century that the wealthy could afford wine cellars. In later quotes, also from the OED, the metaphor becomes *the* creature, and appears to be associated with strong drink. Those quotes where *creature* is spelled more phonemically are attributed to Irish usage.[7]

- 1638 Penkethman *Artachthos*, K iii, The moderate use of the Creature, and sparing Dyet, which is very little practised.

- 1690 Dryden *Amphitryon* III. I, My Master took too much of the creature last night.
- a1695 Wood *Life* (Oxf. Hist. Soc.) I. 298 They would… tiple and smoake till they were over-taken with the creature.
- 1758 Smollett Ct. *Fathom* (1784) 32/2 The German… never went to bed without a full dose of the creature.
- 1772 R. Graves *Spir. Quix.* VII. Ii. (D.) He seems to like a bit of the good cretur as well as other folks.
- 1827 Hone *Every-day* Bk. II. 386 His . . . followers . . . take a little 'crathur'.
- 1888 *Standard* 14 Aug. 2 Says he, 'Maggie, have a drop of the Cratur'.

The animate nature of *the creature* is further reflected in statements such as Shakespeare's comment that a good wine was 'a good *familiar* creature'. We also know that during Shakespeare's time *familiars* were thought to be spirits or demons that witches and sorcerers kept to do their unholy bidding. Shakespeare was an absolute master at wordplay. His choice of words here was almost certainly not coincidental. By using the word *familiar* together with *creature* and *wine*, he is underscoring the significance of the association between wine and the perceived mischievous character of the spirits embodied within it. Imps, whether imprisoned in bottles or not, were also called familiars, and were known for their mischievous nature. Those who imprisoned the imps in bottles, the alchemists, were also the ones who perfected the process of distilling *spirits*, which were kept in bottles as well.

At this point, the argument can be made that, quite early on, the metaphorical use of *the creature* for 'alcoholic drink' was reinforced in large part due to alcohol's inherent animate qualities, but reinforcement would also have occurred because *the creature* had begun to take on euphemistic qualities as well. As a euphemism, *the creature* appears to have been quite effective. Brewer characterizes the references as 'facetious'. *Webster's 2nd* calls it 'dialectal and humorous'. The OED categorizes the usage as 'humorous', while the *Oxford Universal* refers to it as 'jocular'. And, of course, they all associate the usage with the Irish. This unanimity among lexicographers raises the question, *why* is *the creature* perceived as a humorous reference? And why single out the Irish, especially when the citations are from both English and Irish sources? Indeed, a 1960's study determined that the Irish actually consume less alcohol per capita than the English (Bill Sullivan: pers. comm.). Perhaps, it is because the Irish, who have a long cultural tradition of belief in 'the wee folk', were probably quick to realize the common animate link between alcohol and 'good creatures'.

In all likelihood, the truth as to why *the creature* is humorous may be revealed if one takes a brief look at humor itself and tries to find out what it is that causes something to be humorous to begin with. One common form of humor that leads one to laughter is when an incongruous, but *non-opaque*, association is made between entities, occurrences, or objects, where the result of the association is unexpected (Haig 1988:83). If perchance the association turns out to be opaque, it becomes a comedic non-sequitur, an 'I didn't get it' sort of dud. In the case of *the creature*, the reference can be perceived as humorous due to the incongruous nature of the image of a besotted Irishman defending his immoderation with the claim that drink is, after all, one of God's good creatures, and not to be refused.[8] There is more to it than this, though. Few people are unfamiliar with the passage in 1 Timothy 4:4 quoted above. Yet, the majority still interpret the reference to alcohol by the use of the term *creature* as a flippant expression. The reason for this reaction, and the reason why this expression has worked as well as it has for as long as it has, is because of another factor inherent in comedy: people laugh to relieve tension; that is, they laugh when they are *scared* (Sypher 1956). The oddly humorous quality evoked by the expression *the creature* has always been because its reference is more than just a little spooky. It is the sort of reference that sends faint chills dancing up and down the spine. But what is it about *the creature* that causes it to have these sinister overtones, especially in light of such innocuous sayings as 'all God's creatures', and the notion of living things as being 'poor creatures', i.e., objects of pity?

The inherent spookiness of *the creature* may be due to three factors. The first one is that tiny, superficially innocent, and most common of all words in the English language: *the*. The second is the fact that the noun, *creature*, occurs only singularly in this usage—it is *never* pluralized. The third is the fact that the association is non-opaque—in other words, at some level, 'we *get* it'. Thus, by employing two subtle but ultimately powerful grammatical elements, the expression *the creature* includes *all* instances of strong drink, no matter where they may be located in time or space. Referring to the contents of a bottle or a glass as *the creature* is associating, via semantic extension, one specific occurrence with all other examples of alcoholic drink *in the universe*. This is accomplished because the grammar of the phrase indicates that there is only *one* creature while the uses of the phrase indicate paradoxically that this singular entity can be associated with any instance of strong drink. Add to this the commonly held belief that a living being is indivisible, and this reinforces even further the notion that *the creature* is not merely some diminutive imp residing in a single vessel that may cause momentary lapses toward frivolity and mayhem. It is instead an omnipresent entity, whose power is more akin to that of the gods of mythology and ancient lore. Once the bottle is uncorked, the glasses poured, and the spirits are sampled, this creature has the power to possess anyone's actions and thoughts, no matter where a person hides, no matter how many or how few souls are within its sphere of influence.

5. CONCLUSION. In the preceding exposition we have seen how the two terms, *crater* and *creature*, which derive respectively from PIE roots **kerə-* 'to mix' and **ker-* 'to grow', shared in English a historical phonological similarity and a peripherally common semantic field; namely an association with alcohol. However, though these lex-

emes are reflexes of phonologically similar Proto-Indo-European roots, which have, arguably, similar meanings themselves, the historical data gathered in favor of a possible contamination at the proto-stage is perhaps best considered as circumstantial. Likewise, in all likelihood there was little, if any, influence on the way the descendent forms *crater* and *creature* were and are used even today. Although at first blush the argument on the possible contamination of the two phonologically similar roots at some point in the history of English may have seemed compelling, in this paper a more probable reason for the metaphorical association between *creature* and *alcohol* has been offered. More specifically, the association between *creature* and *alcohol* is due, in part, to the physical properties of alcohol and, in part, to cultural factors. Indeed, a direct chain of evidence attests to the use of the term *creature* as a reference to alcohol going back to the biblical quote and pointing to perceptual and sociocultural forces as agents of change exerting a powerful influence on the language and shaping it in ways that, at times, are unpredictable. Such forces were surely at work when the term *creature* was adopted into English; first as a rather innocuous metaphor for 'fruit of the harvest' and then, over time, as a narrowed association with tobacco and alcohol, until finally, its usage became fossilized as a result of pejoration to a metaphor for distilled spirits (Rawson 1995:5). These same forces, however, can explain why the metaphor, which survives to the present day, comes across as puzzling, comical, and very Irish.

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[1] Our thanks to Bill Sullivan for reading the original draft and taking the time to make many useful suggestions.

[2] The OED cites the 11th century French *créature* as the origin of the term in English.

[3] Support is provided by John Gower (1325?–1408), an English poet and friend of Chaucer, who twice used the word *creature* in the prologue to his *Confessio amantis* (c 1386–1390), a poem written in octosyllabic meter. In his verse, *creature* must also be pronounced trisyllabically to preserve the meter. In Chaucer's *Troilus and Criseyde*, the same holds true.

[4] Determining the pronunciation with a high degree of certainty is problematic due to the way Chaucer rhymed words. In this case, he didn't even rhyme the entire final syllable, only the -*ure* portion of it. As a result, one will see *creature* rhyming with words like *nature*, *aventure* (sic), *endure*, *dure* (sic), *engendrure* (sic), *figure*, and *mesure* (sic). These occurrences are sufficient, however, for us to surmise that the final syllable was most likely pronounced /tur/.

[5] The OED lists two modern pronunciations, one with a palatalized /t/ and the other with an affricated /t/, with the palatalized version being the first of the two. Kökeritz claims that -*ure* was pronounced [ər] in all environments and that 'there is no trace of the modern spelling-pronunciation [tʃə]' (1953:271).

[6] Though there is no evidence that these roots indeed have a common origin, they nevertheless seem to share portions of the same semantic continuum: consider, for instance, that one *mixes* soil, water, and seed to *grow* crops, and that one *cooks* the fruits of the harvest after *growing* the crops.

[7] The phonemic spellings of the Irish quotes illustrate quite well the movement of the long vowels in the Great English Vowel Shift by their own lack of movement in Irish usage. By the late 18th century, English pronunciation had drifted so far away from that of the Irish that the phonemic spelling of the Irish pronunciation, which *hadn't changed*, must have been felt to be necessary (Bliss 1984). These instances and others, such as the last line in the Irish drinking song, 'Tim Finnegan's Wake', where *creature* is spelled 'crater', illustrate that, whether or not a semantic transfer occurred between *crater* and *creature*, the homophony was there nonetheless

[8] We thank Bill Sullivan for pointing out the following quote: 'You cannot send Shipper to jail for being drunk, Major. He is the town drunk.' from *The Irish R. M.* (Somerville & Ross 1984).

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THE GRAMMAR OF THE 1635 *SCOTTISH METRICAL PSALTER*

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The syntax found in the 1635 *Scottish metrical psalter*,[1] containing the 150 paraphrases of King David's Psalms from the Old Testament, appears to be quite different from that found in vernacular Scottish-English, suggesting that the Psalter grammar differed from that governing vernacular usage. The vernacular grammar produced regular sentences, responding to linguistic concerns. The Psalter grammar produced regular and irregular sentences, responding to linguistic concerns and to something else. How this dual function was accomplished is the focus of the current research. The question was to determine the factors and the mechanisms involved that produced the Psalter grammar. Normal sentences were not the sole output of the grammar—the task had been expanded to include the generation of 'abnormal' sentences as well.

The bizarre syntax of the verses of the 1635 *Scottish metrical psalter* is very apparent. The differences between the two types of syntax occurring in the Psalter suggest that the underlying grammar is quite different from that of the vernacular Scottish-English of 1635. However, this suggestion is not validated by analysis. The Psalter grammar responded to other undefined factors, which gave it its peculiar and particular syntactic characteristics and which did not affect normal syntactic production.

Analysis of the data reveals that the Psalter grammar generated regular syntactic order using established linguistic processes of the grammar to do so. However, the bizarre syntax came through the deamnds of non-linguistic factors which controlled the production of irregular syntactic order. There was only one grammar, not two. The first of these non-linguistic factors was the requirement for simplicity of music and text because of illiteracy. The second was the metrical requirement of the musical line that demanded a word syllable for each musical note per line. The metrical adaptation of popular music and songs to the psalms was so that the non-literate congregations only had to learn the words, not the tunes. The third non-linguistic factor was the requirement for line-end rhyme. This forced the syntax into unusual word order and/or word choice for fulfillment. The fourth was the requirement for resolution of the conflict between the metrical rhythm of the melodic line and the prosody of the poetic line. Fulfillment of these requirements defined the grammar of the Psalter, simultaneously producing many instances of semantic ambiguity and in some cases even unintelligibility.

The mismatch between language prosody and the musical metrics had its origins in the musical and translation history of each psalm. A few psalms were first translated from the original Hebrew into vernacular German paraphrases by Martin Luther and set to popular German airs and songs. These in turn were translated into vernacular French paraphrases but still sung to the original German tunes. Others were translated from Hebrew into vernacular French paraphrases but set to popular French songs and airs. The English repeated the same process, translating some of the untranslated psalms from the original Hebrew into English paraphrases, and setting them to popular English music. They also translated the German and French paraphrases into English paraphrases, maintaining the original music. The Scots in their turn translated the remaining untranslated psalms from the original Hebrew into Scottish-English paraphrases, setting them to Scottish songs and tunes. They also turned the German, French, and English paraphrases into the vernacular Scottish-English paraphrases, maintaining the original music of each. The 150 paraphrases were then forced into a metric-syllabic format, adapting the poetic line to the musical line—a round hole/square peg operation which very much affected the meaning and word order of line and verse.

Because the prosody of the original language fit the music written for popular songs in the same language, the metrical and prosodic alignment was good. However, the fit was less than felicitious for the later paraphrases: the language prosody of French, German, English, and Scottish English all differed from each other, and the music written for songs in other languages did not fit the prosody of Scottish-English. Certain linguistic adjustments were required to attain a tolerable fit. It is these linguistic adjustments which gave the 1635 *Scottish metrical psalter* its unique syntactic structure.

The paraphrase of each psalm was made up of a variable number of stanzas. Each stanza consisted of a variable number of verses and lines determined by the original Hebrew psalm and the number of musical lines. Each stanza had a line-final rhyme scheme in varying patterns, such as *abab* or *abcb*, the two most common patterns. Each poetic line matched a musical line with each word syllable assigned to a musical note. If the number of syllables could not be pared down, then eighth, quarter, or half notes were used to attain one note per syllable to meet the required number of whole notes per line. Each word line had a variable number of beats (4, 6, 8, 10) determined by the musical line. Each psalm had its own metrical tune usually in Common Meter, Long Meter, or Short Meter.

The lack of fit between the metrics of the original music, which suited the language of the original paraphrase, and the poetic prosody of the later paraphrases in another language forced linguistic action in order to attain a match, often less than satisfactory. In order to satisfy non-linguistic demands of end-rhyme and syllable/note match, simplicity of music and language, and conflict between melodic rhythm and language prosody, various linguistic strategies were used.

The first strategy used was syllable addition. It was accomplished by the following linguistic processes:

(1) Insertion of tag clauses—extraneous, unrelated filler clauses:
  a. For in this wise the Lord himself
    did say to me, *I wot* [Psalm 2/verse 7, line a–b (afterward 2/7a–b)]
  b. make haste to hear me, Lord, *I pray* [102/2c]

(2) Assignment of auxiliary function to the main verb *do*:
    The feare of God is excellent
    and *doth* endure for ever. [19/9b]

(3) Use of hortatory mood instead of imperative (adds two more syllables):
    preserved *let me be* [140/4b]

(4) Use of imperative mood with subject:
    now judge *thou* me [7/8b]

(5) Use of adverbial imperative without verb (two-syllable adverb):
    away from mee all yee that work iniquitee 6/8a-b

(6) Duplication of subject, verb, object, adverb, or adjective either by different words having the same meaning or actual repetition of the word:
  a. *mine* heart *it*… [27/3b]
  b. his arrows *keene* and *sharp* [7/6b]
  c. Hee *digs* a ditch, and *delves* it deepe [7/15a]
  d. For lo *the time*, *the time* I say [102/13c]
  e. Behold, he strake the *stonie rock* [78/20a]

(7) Use of interjection, vocative case, and apposition, often in the same line:
    O (interjection) *Lord* (vocative), *my God* (vocative apposition), *the strength and stay of my salvation* (vocative apposition) [140/7a-b]

(8) Addition of *for* in infinitive and interrogative constructions:
  a. *for to get* a prise [19/5d]
  b. *For why?* no man among the dead remembreth thee one whit [7/5a-b]

(9) Addition of new material not found in the Hebrew text at all in order to meet metrical demands:
    The Kings and Rulers of the Earth
    conspire and all are bent,
    against the Lord, *and Christ his Son*
    whom he amongst us sent. [2/2a–d]

(10) Inclusion of non-essential words:
  a. shall praise thy name *therefore* [140/12c]
  b. Hee comfort will their heart *indeed* [27/14b]

Syllable reduction, the second strategy, was accomplished as follows:

(11) Creation of one word which encompassed the meaning of a whole clause:
The world also is his domaine,
with the *indwellers* all. [24/1c-d]
(< *with all those who dwell within* in the King James Bible, Psalms 24/1)

(12) Gapping, a process that deleted any previously stated word, words, or syllable regardless of class or category:
a. One thing I have the Lord besought,
That I may in his house still dwell:
To see his beautie [sur]passing thought (syllable gapped)
His temple eke which doth excell. (infinitive gapped) [27/4a–d]
b. Thy godly name, thy word has most advanced
which doth excell, and ought to be inhanced (relative pronoun gapped). [138/2c–d]

Gapping can also affect meaning by leaving incomplete constructions as occurs in the deletion of the object *me* in (c) below. The last line is left hanging without an object in order to fulfill the rhyme pattern *aabb* metric requirements.

(12) c. For thou in high estate mee plac't
and down to dust again hath cast. (object *me* gapped) [102/10c–d]

(13) Use of adjectival substantive:
For in the best of his own heart
th'*ungodly* doth delight: (< the ungodly man)
So doth the *wicked* praise himself (< the wicked man)
and doth the Lord despite. [10/3a–d]

(14) Alternative use of word in two-word construction, as in the two-word subordinator *so that*:
And keepe mee [so] *that* presumptuous sins
prevaile not over mee:
And *so* [that] I shall be innocent
and great offenses flee. [19/13a–d]

Either syllable reduction or addition, according to the syllablic number requirement of the line, could be accomplished by the same linguistic process:

(15) Vocabulary choice:
my strength and life *also* is hee [27/1c]
and *eke* deliver mee. [7/1d] (*also* and *eke* have the same meaning)

(16) Full or reduced relative clause:
a. O then all they *that trust in Christ…* [2/13c]
b. and strengthened hast my soul *so sore oppressed* [138/3b]
(17) Ellipsis:
a. So that hee *feel'th* his mighty hand [7/11c] ('feel'th' pronounced 'feelth')
b. Which bring*eth* forth most pleasant fruit [1/3c]
(18) Syllable addition or deletion:
a. My soul is troubled very *sore*
and vexed vehement*lie* [7/3a–b]
b. I laide *me* down, and quietly [3/5a]
And in that Law does exercise
himselfe both day and night [1/2c–d]
c. *many a yeare* [96/8c]
many yeare [95/8c]

Five linguistic processes were used to fulfill the line-end rhyme requirement, each of which involved changes in the word order by rearrangement of elements in a syntactic unit. These processes were dislocation, disjunction, both dislocation and disjunction, fronting, elision, omission, and deletion of an essential word.

(19) Dislocation (word order reversal):
a. that takes thy *children young* (noun+adj<adj+noun)
to dash their bones against hard stones
that lie *the streets among*. [137/9b–d] (NP+prep<prep+NP)
b. My sillie soul *up-take*. [6/4b] (particle+verb<verb+particle)
(20) Fronting—the movement of a syntactic component from a clause or line medial or final position to the clause or line initial position. In example (a) below the prepositional phrase of the genitive construction is fronted, leaving its governing noun phrase line final so that *yoke* will rhyme with *broke*:
Shall we bee bound to them, say they?
let all their bonds be *broke*:
And of their doctrine and their law
let us reject the *yoke*. [2/3a-d] (PP…NP<NP…PP)
(21) Disjunction: where the elements of a syntactic unit are separated from each other by the insertion of an extraneous element from another syntactic unit in order to fulfill the rhyme scheme:
This is *the stock and offspring* eke
of those that search for thee [24/6a–b] (GovNP+gen marker, disjunction)

(22) Dislocation and disjunction: A combination of dislocation and disjunction together were also used to satisfy the rhyme scheme regardless of syntactic and semantic distortion. In example (a) below there is disjunction of the verb phrase *may be seen* and the infinitive *to beare* in order to complete the rhyme pattern *abab*, along with disjunction and dislocation of the infinitive phrase *to beare* and the direct object *Adders poison*. Dislocation of the locative phrase *under their lips* and the infinitive phrase *to beare* permitted the rhyme scheme of the entire verse to be fulfilled.

They whetted have their tongs as keene
as in the serpents speare:
They *Adders poison* may be seene
under their lips to beare. [140/3a–d]
(DO…infinitive<infinitive…DO)

(23) Omission of an essential word for rhyme, thereby affecting meaning—a not unusual occurrence. If context did not supply the meaning of the missing word, line meaning was obscured. The omission of the noun in the prepositional phrase *from thine* below leaves the meaning indefinite:

What is the cause that thou O Lord
art now so far from *thine*:
And keepest close thy countenance
from us this troubleous *time*. [10/3a–d]

The metrics of the musical line and the prosodic line were often misaligned for those psalms that were first translated into vernacular French or German paraphrases and then set to French or German popular music. Because the music was written to accommodate the prosody of French or German, it did not and could not accommodate the prosody of Scottish-English without something giving. Many lines medially and/or initially show occurrances of dislocation, disjunction, a combination of dislocation and disjunction, and fronting. These were used to correct the line initial and medial misalignment of prosody and metrics which did not involve the line final rhyme scheme.

Prosodic misalignment involves the interaction of the rhythm of the melody (the tenor line in 1635) and the prosodic rhythm of the verse. If the normal language stress patterns did not fit the melodic rhythm, then the language elements were rearranged to fit the music. This was accomplished by rearranging syntactic word order where necesssary to accommodate the combination and placement of whole, half, quarter, and eighth notes of the tune. The language processes that accomplished this are all defined above.

(24) Misalignment of melodic rhythm and language prosody:

a. Hee laide the sea like heaps on hie,
Therein *a way* they had (object/subject-verb disjunction)
on foote to passe *both fair and dry*
whereof our hearts were glad. [66/6a–d]
(**bold**=PrepP/infinitive dislocation)

b. Hee *comfort will* their heart indeed [27/14b]
(clause medial—main verb/aux dislocation)

c. *Burnt offerings* I will give to thee
of incense and fat rams. [66/15c–d] (genitive phrase disjunction [object/reduced rel cl disjunctino])

d. *of those* that compasse me O Lord,
the chief and principall [140/9a–b]
(genitive dislocation and disjunction)

e. *Vaine workers of inequitie*
Thou hast alwaies abhord. [5/5c–d] (Fronting of object)

Not all attempts to fulfill rhyme patterns and to correct musical rhythm and prosodic misalignment resulted in 'good' syntax. Some attempts resulted in syntactically awkward lines, as well as those that were semantically distorted and often nonsensical.

(25) Syntactically and semantically distorted lines:
In peace therefore lie down will I [4/9a] (< therefore I will lie down in peace)

Abnormal syntactic breaks also occurred which affected meaning. In example (26) below, the subject is a-line final while the predicate forms the b-line in which the syntactic clause end is line medial because of dislocation for rhyme. The lack of the syntactic and musical correlation at the line end makes the semantics peculiar. The line end of music and words were usually the line climax with the last note being held. The lack of synchronicity gives *hee* a musical climax subordinating the predicate in the b-line, thereby forming a semantic anticlimax.

(26) Abnormal syntactic breaks:
Mark well the wondrous works that *hee* (subject)
for men to passe hath brought (predicate) [66/5a-b]

The valiant attempts to honor rhyme requirements using the linguistic processes illustrated above created semantic ambiguity. Dislocation of double objects and their conjunction occurred as well as dislocation of main and auxiliary verbs with fronting of the conjunction, second object, and prepositional phrase.

(27) Semantic ambiguity and syntactic reordering:
Hee that is such the Lord will send
his blessings *him upon* (PrepP element dislocation)
and *righteousness unto him* **lend** (2nd object and PrepP fronting)
shall God *his salvation*. (main verb/aux disloc; main verb, Aux/subj dislocation)
[24/5a–d]

The meaning of the paraphrase can border on unintelligibility simply because semantic cues are lacking in that word order is skewed and doesn't, and can't, indicate meaning.

(28) Semantic blurring resulting in unintelligibility:
Performe thy kingdoms promised
to me which wrong sustaine. [7/6c–d]
(< Awake for me to the judgement that thou hast commanded. KJ 7/6c–d)

The pinnacle of semantic obscurity is reached below in the distorted word order: 1, the medial placement of the introductory adverb *though* and the clause final locative *there*; 2, the line final placement of the subject *an host* by subject/ verb dislocation; 3, subject/verb number disagreement caused by a subject marked singular but plural in meaning, yet coupled with a verb marked plural (*pitch an host*), and 4, repetition of the subject (*mine heart…it*). All these interact to distort the syntax and the meaning:

(29) a. Against me *though there* **pitch an host**
Mine heart *from fear* yet *far* it is [27/3a–b]
(=Though an host pitch against me there,
yet mine heart it is far from fear.)
b. With grevious plagues and sore
All Ægypt smote he *than*:
Their first borne lesse and more
He slew of beast and *man*. [136/10a–d]

Meaning was also affected when fulfillment of the rhyme pattern forced the selection of a word that rhymed but was semantically the wrong word to use. The form and sound of the selected word was similar to that of the deliberately excluded correct word, which did not follow the rhyme scheme.

(30) Vocabulary selection by form similarity and rhyme instead of meaning:

a. The liars and the flatterers,
Thou shalt destroy them *than*: (for *then*)
and God will hate the blood-thirstie
and the deceitfull *man*. [5/6a–d]

b. I trust in God, how dare yee then
say thus my Soul *untill*, (for *unto*)
Flee hence as fast as any fowle
And hide you in your *hill*? [11/1a-d]

The use of *untill* for *unto* is also lexical selection for rhyme. However, here *untill* of Scandinavian origin has the same meaning as *unto* but has the form and sound that match *hill*.

The grammar of the 1635 *Scottish metrical psalter* had to respond to the extralinguistic factors of illiteracy, requirement for simplicity of words and music, line-end rhyme, and a metrical musical line that demanded from the verse one syllable per beat. Concomitantly, it also had to respond to linguistic factors as well. The result was that the Psalter grammar had to generate both regular and irregular sentences. Regular sentences were generated solely from a linguistic basis, while the irregular sentences were generated in response to the extralinguistic factors listed above. The same processes generated both regular and irregular sentences, but were applied in response to unrelated factors. These were linguistic processes long available in the grammar, not processes developed for the occasion. The metrical psalm maker used the grammatical processes current in the vernacular grammar in order to fulfill the extralinguistic requirements. Thus he created the peculiar syntactic forms found throughout the Psalter.

Although the meaning of the psalms is often blurred and in some cases incomprehensible, with rules of syntactic order violated left and right because of required rearrangement to honor the rhyme and metric schemes of the line, their popularity and use did not lessen. In fact, the latest edition of the *Scottish metrical psalter* was published in 1929 by Oxford University Press and is still used in some Scottish congregations. It is as if the music covered a multitude of lapses, both syntactic and semantic—lapses that were considered to be far less important than the force of the music. This suggests that it was not so much what words were sung, but what was felt and believed, reinforced by the idea that even if the meaning was incomprehensible to man, that was all right because all things were known to God. Congregational singing of the metrical psalms was fulfillment of a long-suppressed desire of ordinary people to directly worship God with their own voices in their own language. Semantic obscurity and ambiguity, even nonsensical verses, along with syntactic peculiarity were irrelevant.

There is no question that the language of the 1635 Psalter was forced to fit the music, and not the reverse. The forcing caused all the syntactic and semanic errors in direct contradiction to the guiding premise of the 1929 *Scottish metrical psalter*:

The words must not be made to fit the music;
The music must be able to fit the words. (Preface, v.)

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[1] This paper is dedicated to Al Gleason who stimulated my interest in the Psalter grammar by saying the sentences were distinctive, obvious, and peculiar. They were that! Finding out why was a challenge.

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Stewart, G. Wanchope, & J. C. L. Pritchard (eds.) 1929. *The Scottish psalter 1929. Authorized metrical version with tunes*. Oxford: Oxford University Press.

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[2] The some 200 books and articles that covered only the social and musical history of the metrical psalms were omitted from these references. None of them dealt with the relationship between the language and the music, nor with the grammar of the 1635 Psalter or of any other psalter.

* * *

‘ACHILLES’ GRUDGE’ AND ‘GROVELING BEFORE THE LORD’: SOME IMPEDIMENTS TO AN ACCURATE TRANSLATION

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When a text is translated not for the first time and the latest translator has access to the previous version or versions, we can fairly expect some improvements—not just differences in taste. If there were out-and-out mistakes, the new scrutiny of the text ought not to succumb to them again; none of them should be repeated in the new translation. Certainly no one would disagree with that. And where an earlier translation, though not quite wrong, was needlessly loose or vague, the new translator can take it as an opportunity or an invitation to reconsider the precise meaning of the original words, and to come up with something that will capture that meaning better. My present essay looks into instances of failure on the part of translators to progress toward a more satisfactory rendering. I seek to understand their predicament—what is it that keeps them from bringing the fullest knowledge of both the source language and the ‘target’ language to bear upon the task of translation? In my opinion, this problem has yet to be adequately discussed, notwithstanding the large amount of scholarship that deals with nearly every facet of the translator’s art.

1. I begin with μῆνιν, the opening word of the *Iliad*, which has been translated ‘wrath’ or, less often, ‘anger’ by teachers of Greek as well as by professional translators. In all Occidental literature over the centuries, few passages have been more familiar than the verse which expresses the theme of Homer’s great epic:

> μῆνιν ˧άειδε θεᾱ́, Πηληϊάδεω ˧Αχιλῆος
> {mɛ̂nin áeide tʰeā́ pɛlɛïádeɔ akʰilɛ̂os}.

The other Greek words present no difficulty: ‘of Peleus’ son Achilles sing, goddess’.

The first English translator, George Chapman (1598), wrote ‘Achilles’ banefull wrath’;[1] and most of Chapman’s successors, whether or not they looked up his rendering, felt no need to depart from his choice of an English noun. To be sure, as ‘wrath’ took on an archaic ring, some wrote ‘anger’ instead. Only in the last few years did three quite separate translations, by Robert Fagles (1990), Michael Reck (1994), and Stanley Lombardo (1997), fasten upon ‘rage’, which strikes me as a change for the worse; for it does not aptly characterize the behavior of Achilles[2]—

he imposes grief or pain upon the Achaians, his erstwhile comrades, by *withholding* his martial valor from them so that their enemies, the Trojans, can put them to rout. He does the Achaians no bodily harm. His impulse to run Agamemnon through with the sword, at the height of their quarrel, is checked by the apparition of the goddess Athene, who urges him to halt his rage (μένος {ménos}) and to rebuke Agamemnon in words only. Achilles obeys her; his one act of violence is to throw the scepter to the ground at the end of his speech.

Almost from my first acquaintance with Homer in Greek some fifty years ago, I was vaguely dissatisfied with the rendering 'wrath' for μῆνιν (or for the nominative μῆνις {mênis}). Recently it concerned me enough to examine all the other passages in the *Iliad* and the *Odyssey* where this noun occurs or the verb derived from it, and I concluded that a more accurate English word for μῆνι$^{ς/ν}$ would be 'grudge' or 'resentment' or 'rancor'. In particular, when after Achilles' withdrawal from combat the Achaians suffered defeat and three friends, sent by Agamemnon, came to Achilles with a plea for reconciliation and an appeal on behalf of the Achaian army, Achilles turned them down with these words: 'Everything that you said seemed to me acceptable (κατὰ θυμὸν {katà tʰūmòn}); but my heart swells with gall whenever I remember all that—how Atreus' son [Agamemnon] made a fool of me in front of the Argives[3] like some dishonored outsider'. That sounds like a *grudge* which he bore Agamemnon, and which could not be overcome; only after it cost the life of Patroclus, Achilles' dearest friend, was Achilles ready at last to set the grudge aside.

Why has this rendering of μῆνι$^{ς/ν}$ not occurred to someone before me? That, in itself, is a small matter, but worth exploring because we have here an unusually documentable instance of a broader question, mentioned in my opening paragraph: What keeps translators and teachers from choosing the best match available in the vocabulary of two languages? Of course a rendering that goes very well in some contexts might not be appropriate in others; e.g., the French noun *femme* is quite equivalent to 'woman' in *une jeune femme* 'a young woman' or in *une femme belge* 'a Belgian woman', but to translate *sa femme* as 'his woman' (rather than 'his wife') would grossly misrepresent the relationship between the two persons.[4]

It makes little difference whether or not I am the very first one to propose that μῆνι$^{ς/ν}$ in Homeric Greek is equivalent to 'grudge' in English (rather than to 'wrath' or 'anger' or 'rage'). I cannot guarantee that no translator of the *Iliad* has used this word: although I have examined all the English versions to be found in the library of SUNY-Binghamton—about twenty—there are several others published but not readily available for me. Yet, even if it turned out that one or two of them did render μῆνι$^{ς/ν}$ 'grudge', my essential argument would still hold: the equivalence between μῆνι$^{ς/ν}$ and *grudge* has not made headway among the Anglophones expert in this ancient language over so many centuries.

Bilinguals often become aware of not readily finding a satisfactory equivalent in one language for an expression that occurs to them in the other. Such experience includes many of them who are not professional bilinguals, their proficiency being due simply to the circumstances of their childhood. Beyond that, such experience on the part of *influential* people contributes, more than any other factor, to the introduction of new vocabulary into the deficient language, as the introduced words gain a niche in the memory of monoglots also.

Perpetuating the knowledge of an ancient language, however, is something very special, if it is not used conversationally even by the scholars. When the study of Greek was revived among learned Italians in the fourteenth century and spread from them to the rest of central and western Europe, Latin remained the international language of the educated in those countries. So, when Chapman translated the *Iliad*, there was no Greek-English dictionary, and access to Greek was rather indirect, presupposing a good command of Latin from earlier instruction. Greek books were not yet printed in England but had to be imported from the Continent. If Chapman had access to any dictionary, most likely it was *Thesaurus Graecae Linguae* of Henricus Stephanus (Henri Estienne; [Geneva] 1572), or an abridgement of that monumental work. No doubt there were teachers who, without owning a printed dictionary, had handwritten lists, more or less adequate to their needs. In any case, Chapman was more a poet than a scholar; his achievement, however, ought to remind us that a fairly high level of learning could be attained with much leaner resources than we now regard as indispensable.

Nevertheless, it would have been far out of the way for Chapman even to consider writing 'Achilles' grudge'. While *grudge* was a familiar item in the English vocabulary, used much the same then as now, it was not in contact with other languages; the word hardly ever occurred to an educated Englishman when dealing with French or Latin—let alone, with Greek. The chain of erudition, however, linked μῆνις explicitly to the Latin noun *ira*;[5] and equating *ira* with *wrath* had been habitual for centuries, going back at least to the Old English gloss *wræððo* on *ira* (ablative case) in the Lindisfarne Gospels (Mark 3:5). So, when Chapman was first studying Greek, it must have been perfectly normal to understand μῆνις as 'ira', hence 'wrath'.

Later, when he came to translate the *Iliad*—i.e., to recreate in English verse a great epic poem—he was of course not restricted to the glosses that had been habitual for him from his school days. He could draw, in principle, upon anything in his entire vocabulary. But still there were weighty obstacles.

Among them the most prominent was one that faces translators in every age: Important words, expressing something broad and not at all concrete, show only a rough correspondence from one language to another. A translator, being aware of this, would implicitly reject a word in the 'target' language that conveys some noticeable distortion. But if all the potential renderings fall short in one way or another, some word or more complex expression must be made to serve.

Let's suppose that *grudge* did occur to Chapman, or to some translator afterwards. It may already have acquired an overtone of moral disapproval, which goes with it now, as we expect persons of good character not to hold a grudge, even after being sorely wronged. If we sympathize with them, then by a twist of logic we do not call it a grudge, and thus we avoid casting blame upon them. I cannot be certain that for Chapman to begin the translation of the *Iliad* with 'Achilles' grudge' would have implicitly disparaged the hero at the very outset, and thus prejudiced his readers against Achilles as too petty to deserve their admiration. But it is certain that several subsequent occurrences of the noun μῆνις refer to a god; and so a translator who has committed himself initially to 'Achilles' grudge' ought, at least for the sake of consistency, to write 'Apollo's grudge' (1.75, 5.444, 16.711) and 'Zeus's grudge'[6] (5.34, 13.624, 15.122)—which would involve a further complication.

Why not impute a grudge to a pagan god? After all, the human emotions or passions of the gods, as depicted by Homer, were notorious. A succession of Greek philosophers before the Christian era criticized the poet for misrepresenting the divine nature;[7] but the readers of poetry were delighted beyond measure by the lively carryings-on among the gods and goddesses, and educated Christians went on enjoying this literary heritage, long after the actual worship of those divinities had been abandoned and any temples that remained had been converted into churches. Even so, a thoughtful Christian who read the *Iliad* could scarcely overlook the extent of similarity between the behavior of those gods and what is told in many parts of the Bible about the one true God: how God's wrath often strikes the offender down not immediately but after an interval. In that regard one attribute of God resembles a human grudge. Still, to call attention to the resemblance is indiscreet, liable to offend a religious reader.

In passing, I mentioned the alternative renderings 'resentment' and 'rancor', neither of which I find in any translation of the *Iliad*; nor are they recognized by dictionaries as equivalent to μῆνις.[8] Samuel Daniel, a poet contemporary with Chapman, wrote 'Though this king might have resentiment' (four syllables, as in the French *ressentiment*, from which the English noun was borrowed). According to the *Oxford English dictionary*, this is the only documented instance before 1600; the verb *resent* came in a little later. Any Englishman that knew French well would have understood *re(s)sentiment*; but it may not yet have been established in the general English vocabulary so as to come into Chapman's mind as perhaps a better choice than *wrath* for the opening verse of the *Iliad*.

By the time of Alexander Pope, whose version of the *Iliad* was published in 1715, *resentment* along with the verb *resent* was doubtless familiar enough to well read or educated people, even if they happened to be weak in French. It had its own place as an English word, but it did not attract Pope, the finest poet of that age; he kept 'Achilles' wrath'. Probably neither Pope nor any translator after him felt that resentment goes with a heroic character. I would agree that we associate it with people no more noble than ourselves, and so it would not do to announce the theme of the glorious epic as 'Achilles' resentment'.

The word *ranco(u)r* has a longer history in English (see OED). The Latin noun that it goes back to is from the same root as the adjective *rancidus*, and originally must have meant 'rottenness' or 'festering'. As first recorded in an epistle of St. Jerome (13.1), it refers to a figurative festering within the chest, associated with *odium* 'hatred'.[9] English writers long before Chapman had used it in virtually the same sense as Jerome, but for the most part *in combination with some other word*, probably more familiar: 'ful of venym, of rancour, and of hate', 'wreche & rankure', 'yll wyll and… rancoure', 'rancour and vengeaunce in their hartes'. If 'rancor' could have been freely used without an accompanying synonym, it would have served very well at the opening of the *Iliad*.[10]

My personal preference is divided between 'Achilles' rancor' and 'Achilles' grudge'. No other English word, unless we see fit to draw upon the technical jargon of psychiatrists, expresses so well these crucial aspects of μῆνιϛ/ν: how relentlessly it grips Achilles (or anyone else), and how it overrides any kindlier motive. Everyone who reads the *Iliad*, either directly or through a translation, ought to appreciate μῆνιν… Ἀχιλῆος for what it is. Lexicographers, teachers of Greek, and translators have not communicated it adequately.

2. A Biblical Hebrew verb, exemplified most frequently by its preterite form וַיִּשְׁתַּחוּ{wayyištáhuʷ} (Gen. 18:2 and 41 other passages), has usually been rendered 'and he bowed down' or 'and he bowed himself' or 'and he worshipped' in English translations.[11] The Septuagint constantly rendered it πϱοσεκύνησε(ν) {prosekúnɛse(n)}; and where any form of this Greek verb occurs in pagan texts, our Hellenists gloss it variously: 'make obeisance', 'fall down and worship', 'prostrate oneself before'.[12] Evidence from Hebrew and Greek converges to make pretty clear what the action was physically: The Greek compound verb consists of the root that means 'kiss' and the prefix 'toward, in the direction of'; however, we have historical information to prove that it did not amount to merely throwing a kiss, but rather kissing the ground in front of the other person (expressed in the accusative case, with no preposition as a rule).[13]

The Hebrew verb is often, though by no means invariably, followed by אַרְצָה {ʔárcɔʰ̄} 'to the ground', sometimes by אַפַּיִם {ʔappáyim} 'nostrils' or עַל־אַפָּיו {ʕal-ʔappɔ́(ʸ)w} 'on his nostrils', and sometimes by the combination 'nostrils to the ground'. No Biblical passage has 'mouth to the ground'; no one is said to kiss the ground or to lick it. But the context does indicate something more than a deep bow—namely, dropping to the ground intentionally, face down and as fully prone as in an accidental fall. That physical act can be expressed in English by the reflexive verb *prostrate* or by the ordinary verb *grovel*; the latter has, for us, a strongly pejorative connotation, but it was not always so.

Neither verb was used in the English Bible translations of the classic age, the sixteenth century and the beginning of the seventeenth, for the Hebrew (-)שתחו-. The Latin Vulgate had rendered it mostly by *adorauit*, *adorauerunt* (and other forms of *ador-*); hence the English Catholics favored either 'adore(d)' or its native English equivalent 'worship(ped)'.[14] In the Apocryphal book of Judith (10:20[23]), however, the Douay Version has 'she… bowed down to him [Holofernes], prostrating herself to the ground' for *adorauit eum, prosternens se super terram*, while the King James Version 'she fell down upon her face, and did reverence unto him' is based on the Septuagint πεσοῦσα ᾿επὶ πρόσωπον προσεκύνησεν ᾿αυτῶ {pesoûsa epì prósɔpon prosekúnɛsen autɔ̂}.[15] Although the Hebrew original was not preserved, the Greek προσεκύνησεν allows us to reconstruct *ותשתחו.

Since *ador-* had apparently preempted the field as the Latin rendering of this Greek verb and its Hebrew forerunner (-)שתחו-, *prostern-/prostra-* was deemed suitable only for a collateral verb.[16] The English derivative *prostrate* (through the participle *prōstrātus*) found very limited employment—none at all in the King James Version of 1611. Only toward the end of the twentieth century has there been a noteworthy change: now the New Revised Standard Version and the New American Standard Bible use the reflexive verb *prostrate* in several passages, though not in others where it would also convey most precisely the meaning of the Hebrew. I am grateful for this particular improvement, while realizing that in the modern world many other translations of the Bible are bound to circulate, each with its merits and defects. Varied and unequal as the qualifications of the translators may be, the public that depends upon translations is better off in the long run for this multiplicity.

This Hebrew verb has reflexive meaning built into its morphological structure.[17] But in English the separate reflexive pronoun 'himself', 'herself', etc., is on the awkward side; the verb *prostrate* is hardly ever used nowadays apart from a reflexive construction.[18] So a translator may feel some stylistic repugnance against writing, 'he prostrated himself', or against reading it aloud, even though it captures the sense of this Biblical word better than anything else in English, with one likely exception: the verb *grovel*, which has a very odd history.

It may go back to an Old Norse noun in the phrase *á grúfu* 'on the face' or 'face down'. At any rate, in Middle English of the fourteenth century an adverb *groveling* turns up; e.g., the verses

> 'Þise alder men quen he aproched,
> Grouelyng to his fete þay felle';

and in prose from 1483, 'They were trobled and tremblyng fyl doun groflyng on theyr faces upon the ground' (quotations from the OED). Later it was reinterpreted as though it were a participle; and so, through back-formation, a verb emerged, first attested in Shakespeare's *Henry VI*, Part II, from 1593 (I.ii.9-10):

> 'gaze on, and grovel on thy face
> Until thy head be circled with the same' (i.e., with King Henry's crown).

This posture of self-abasement displayed homage in the presence of royalty.[19]

Had the word occurred to the Bible translators of that age, it would have been perfectly appropriate to every instance of (-)שתחו-; for the Hebrew verb expressed self-abasement before a king, some other highly respected person, or God. But in more recent centuries public opinion—especially in English-speaking countries—has come to disapprove of men (or women) behaving thus toward another human being. The disapproval applies also to *prostration before a holy image*, although most Christians approve of *kneeling* in prayer. So, while they could probably accept a modern translation of Psalm 106:19, recalling the Golden Calf, with this wording (cf. Ex. 32:8):

> 'They made a calf in Horeb, and they groveled to a molten image';

or of Genesis 42:6:

> 'and Joseph's brothers came, and they groveled to him nose to the ground'[20]

for in those circumstances the humiliation, even if unbecoming in itself, was just what those grovelers deserved—it would nevertheless be dismaying to read in I Samuel 1:19 about the admirable couple Hannah and Elkanah, 'and they rose early in the morning, and they groveled before the Lord'. The time is long past when it might have sounded all right to say 'they groveled before the Lord'; yet it is the very same Hebrew verb in all these passages.

Therefore I would settle for 'they prostrated themselves', as the New Revised Standard Version and the New American Standard Bible have already done in some other verses (though not in these three). For the Hebrew original does not treat this posture as unbecoming, except where the context shows either that the man so honored was unworthy (Esther 3:2–5) or that the obeisance was paid to an idol or a false god (Lev. 26:1, etc.). To prostrate oneself before the invisible Lord was altogether proper; for he was not represented by a man-made image.

A translation intended for use in synagogues or churches cannot absolutely disregard, in its wording, one function of the Bible: as a model for the believers' own conduct. Even granted that 'prostrate' catches the meaning of (-)שתחו- better than 'bow' or 'worship', etc., the authorities may still dislike a rendering that does not accord with their ritual, established in the course of many centuries.[21] Concerns of this sort will have the upper hand over the philological ideal, which is to determine—as far as humanly possible under varied circumstances—the true semantic impact of any and every word in the text to be translated. Speaking on behalf of philology, I have to concede that the semantic impact cannot, in the final analysis, be limited to the reader's *understanding*; for there will also be some effect upon the reader's subsequent actions.[22]

There are still other verbs for more or less the same posture: *truckle (to)*, *fawn (upon)*, *kowtow (to)*; all these connote, like *grovel* in present-day English, an attitude of utter servility. The last is from Chinese {k’a^1 t’ou^2} ‘bump + head’, which was proper etiquette in imperial China but repugnant to Occidentals.[23] A Chinese translator of the Bible, working directly from the Hebrew, may judge this combination of characters quite suitable to render (-)שתחוו- ; but *kowtow* in an English Bible would sound ridiculous.

3. ALL MY REMARKS UP TO NOW have been on the presumption that these texts are translated for the purpose of *instruction*, to benefit those who understand the original language not at all, or inadequately. Many texts, including the *Iliad*, were intended rather for enjoyment or entertainment; so a translator can plausibly claim a license to depart from the author’s meaning, when the reader’s pleasure will be enhanced thereby. In extreme instances the translator has even substituted a happy ending; e.g., the English version of Zola’s novelette *L’Attaque du moulin*.[24] So, to choose merely a more agreeable word, instead of sticking closely to the original sense, falls apparently within the translator’s rightful discretion.

I have concentrated, however, on cases where something more significant is at stake in the choice of an English word. Given a text of paramount importance, the translator has not only a duty but an opportunity to *educate* the readers. In elevating that above any other consideration, I reveal my professorial commitment—or bias, if you will. Furthermore I realize that this scholarly motive, if the text has already been translated time and again, may not suffice for someone to undertake and carry through a new translation. To judge from many recent versions of the Bible and the *Iliad*, the translators do not aim mainly at correcting their predecessors’ imperfections or misapprehensions here and there, but rather at expressing either their individual, personal taste, or else their sense of what the present age must have for the sake of adapting the ancient book to the issues of present-day society. That is liable to replace the distortions in past translations with new distortions; but even so, philology has the power to plumb the resources of both the source and the ‘target’ language, and therefore to counsel each translator on every point.

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[1] Moving the adjective from the second verse of the original so that in English it will be immediately construed with the noun. Such minor manipulation of the text was a matter of course, since Chapman was committed to fourteener verses in rhyming couplets.

[2] Reck’s rendering ‘Achilles’ maniac rage’ is quite misleading; for μανίᾱ {maníā} is far different from μῆνις, and Achilles is no maniac.

The word *rage* is often brought in nowadays to explain and palliate, if not to excuse altogether, the violent, reckless crimes committed by boys and young men from the inner cities—even though they appear to be acting coolly, rather than from any overwhelming emotion.

[3] Here ˧Ᾱϱγε̄ί|ο̄ισῐν {argeíoisin} replaces the usually preferred ethnic term ˧Ᾰχᾱιο̄ῖσ̄ιν {ak^haioîsin}, which the metrical pattern of the verse (9.647) could not accommodate.

[4] Hemingway, in the novel *For Whom the Bell Tolls*, thought to give the impression of a Spanish narrator by writing 'the woman of Pablo', a calque upon *la mujer de Pablo*, instead of what we would expect in English: *Pablo's wife*.

[5] Stephanus has the entry 'ΜΗΝΙΣ, ιος, ἥ. Ira permanens' (i.e., lingering wrath).

[6] In Chapman's time, and on into the 19th century, it would have been 'Jove's grudge'; for the rule in English, as it had been in Latin, was to replace the Greek name of each Olympian god or goddess with the equivalent in the Roman pantheon.

Of the recent translators that wrote 'Achilles' rage', Fagles also has 'edging clear of the distant deadly Archer's rage' for μῆνιν ˧αλευάμενος ˫εκατηβόλου ˧Απόλλωνος {mɛ̂nin aleuámenos hekatɛbólou apóllɔnos} (5.444; 'deadly' serves instead of the god's name), and the syntactical paraphrase 'Apollo rages' for μῆνιν ˧Απόλλωνος (1.75), as well as 'the Father's rage' for Διὸς {diòs} …μῆνιν (5.34), 'rage of Zeus' (13.624), 'from Zeus… rage' (15.122). But Reck does not treat either god's μῆνι^ς/_ν as 'rage', and Lombardo has 'the rage of Lord Apollo' only in 1.75; elsewhere he resorts to the adjective 'wrathful' and the nouns 'anger' and 'hostility'.

[7] The *locus classicus* is in Plato's Republic 379b ff., where Socrates does not seize upon any Homeric passage about the gods with the word μῆνις, but he does object (390e) to the advice Achilles got from his old friend and tutor Phoenix (*Il.* 9.515-17): 'If Atreus' son were not to bring gifts… I would not bid you, casting away the grudge (μῆνιν), to defend the Argives—no matter how they need it'.

[8] The highest authority, Henry George Liddell and Robert Scott, *A Greek-English Lexicon*, 9th ed. revised by Henry Stuart Jones (Oxford: Clarendon Press, 1940), 1128, gives just one English word for μῆνις: 'wrath', with a supplementary remark 'of the *revengeful temper* of a people, Hes[iod] *Sc[utum]* 21, H[ero]d[o]t[us] 7.229'. S. D. Woodhouse, *English-Greek Dictionary* (London: Routledge & Kegan Paul, 1910), which was intended mainly as an aid for exercises in Greek composition, defines '**Grudge**, subs[tantive] P[rose] and V[erse] φθόνος [which corresponds more precisely to 'envy']… *Bear a grudge, remember past injuries*: Ar[istophanes] and P[rose] μνησικᾰκεῖν' and '**Resentment**, subs. P. and V. ὀργή, ἥ, see *anger*…' In French, however, Émile Boisacq does gloss 'μῆνις… 'colère, ressentiment"; *Dictionnaire étymologique de la langue grecque* (Heidelberg: Carl Winter, 1923).

[9] '…ut ueteri rancore deposito mundum pectoris Deo paremus habitaculum'. The earliest citation (1225) in a Middle English text, 'Þe oðer kundel is Rancor siue odium: Þet is hatunge oðer great heorte' (Ancren Riwle, 200), shows that *rancor* had not yet entered the English vocabulary but was understood, in the polyglot setting of a monastery, as a Latin synonym for a more familiar Latin word *odium*.

The appropriateness of *rancor* ro render μῆνις was pointed out to me by my daughter, Margaret L. Phillips.

[10] Pope's translation of the *Odyssey* reads:

'Now different counsels every breast divide,
Each burns with rancour to the adverse side' —

an amplification of δίχα δέ σφισιν ͱάνδανε βουλή {díkʰa dé spʰisin hándane boulɛ́} (3.150), in which there was no particular Greek word prompting him to write 'rancour'.

[11] The plural וַיִּשְׁתַּחֲווּ {wayyi̩štaнăwúʷ} 'and they bowed down' is nearly as frequent (Gen. 33:7 + 27), and many other forms are amply represented in the Biblical corpus.

[12] Liddell – Scott – Jones (above, note 8), 1518, s.v. προσκῠνέω.

[13] When Alexander the Great, after his conquest of the Persian empire, took on many of its trappings, he commanded his Macedonian and Greek companions to make obeisance (προσκυνῆσαι {proskunɛ̂sai}) to him in the Persian manner. Some of them refused, on the principle that only a god—i.e., a god's statue—should be honored thus (Arrian, *Anab*. 4.10. 5–12.5; Plutarch, *Alex*. 54.2–6).

[14] From its morphological structure *ad|ōrā* should mean 'toward' + 'plead'. With this, according to some evidence from pre-Christian Latin, went a posture of bending the knee; e.g., *Alexandrum posito genu adorarint* (Seneca, *Suasoriae* 1.2).

The King James Version never has 'adore'.

[15] In 7:4, where the Vulgate has *prostrauerunt se super terram* and the Douay 'prostrated themselves on the ground', the LXX is substantially (not just verbally) different, and the King James follows it.

[16] In Gen. 19:1 'and he worshipped prostrate on the ground' (Douay) renders the Latin *adorauitque pronus in terram*—'prostrate' for the adjective *pronus*. Here the context is Lot welcoming the two angels who had just entered Sodom, though he may not recognize them as superhuman (cf. Gen. 18:2). The Hebrew is וַיִּשְׁתַּחוּ אַפַּיִם אָרְצָה׃; *pronus* thus represents 'nose'.

In Daniel 3:10 (the section of this book from 2:4 to 6:29 was composed in Aramaic, not Hebrew) the Douay has 'every man… shall prostrate himself', and in 3:15 'prostrate yourselves'. This is for the Aramaic verb יִפֵּל {yippél}, תִּפְּלוּן {tippəlúʷn}, which the Vulgate had rendered *prosternat se* and *prosternite uos*. The context is about worshipping a pagan idol in Babylon; three Jewish captives refused to obey the king's command.

[17] Called הִתְפַּאֵל {hit̄paʔel} by the medieval Hebrew grammarians.

[18] The adjective *prostrate*, being from the Latin *passive* participle, is not saddled with a reflexive pronoun; e.g., *prostrate with grief*.

[19] Or it could be motivated by some physical urgency: '1598 HAKLUYT *Voy*. I.54 In regarde of the great winde we were constrained to lye groueling on the earth' (*OED*).

[20] Joseph had become the governor of Egypt; and his brothers, after such a long time, could not recognize him. When he was seventeen years old, he dreamt of 'the sun and the moon and eleven stars groveling (or prostrating themselves) to me' (Gen. 37:9). The part of it that concerns the brothers came true (43:26); but the text does *not* say that later, when they brought their father along with them to settle in Egypt, he too

prostrated himself to Joseph (46:29-30). The mother had died before all this (35:18-19)—earlier in the narrative than the dream itself!

[21] The synagogues which continue to say many ancient Hebrew prayers, based upon the favorite Scriptural texts, have greatly attenuated the actual practice of prostration, although the words וַאֲנַחְנוּ כּוֹרְעִים וּמִשְׁתַּחֲוִים {waʔănáʜnuʷ koʷrəʔíʸm uʷmištaʜăwíʸm} 'and we bend and prostrate ourselves' are recited every day. The present rule is not to prostrate oneself except when the ark, containing the sacred scrolls, is opened on New Year's and on Atonement Day; then the cantor, at least, does it from his standing position closest to the ark. A former rabbi of Temple Israel in Binghamton (to which I belong) used to encourage the members of the congregation, if we felt like it, to join with him and the cantor in the literal enactment of prostration; but I was the only one that did so, out of many hundreds.

[22] A concern of this sort animates those who in the last few years have been retranslating some Biblical passages, or even the entire Bible, to eliminate 'sexist' language. They part company with philology; for, as they see it, the philological conclusion that the Biblical authors (along with the rest of the civilized world in antiquity) had an androcentric view of everything, and expressed it, must not be allowed to prevail over the modern need to change the roles of men and women from what they used to be.

[23] *Kotow* was the usual English adaptation in the 19th century. The rhyming syllables of *kow-tow* have added phonologically to the tone of disgust, which was not there in the Chinese source.

[24] Entitled *The Miller's Daughter* in *The Works of Emile Zola*, One Volume Edition (New York: Walter J. Black, Inc., 1928), [II] 23. I thank my friend and colleague, Prof. Marilyn Gaddis Rose, for bringing this travesty to my attention. To determine who perpetrated it would not be easy; for no translator's name is given.

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‘FOR HERE CAN NON SOCHE BE HADDE IN THIS CONTTRÉ’: AUXILIARIES ON THE EVE OF MODERN ENGLISH

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The Fifteenth Century was an important period in the history of England and English. Beginning with the death of Chaucer, the century ended with the Wars of the Roses concluded, the Tudor dynasty of Henry VII established on the throne, the birth of the modern English nation state well under way, the introduction of printing to England by William Caxton in the winter of 1475–76, and the Great Vowel Shift, for the most part, completed. In recent years, not a few linguists have located changes, especially in the lexicon and syntax, that led to important features of modern English in the Fifteenth Century. In the main, however, modern linguists have tended to ‘cherry pick’ examples of developments, especially syntactic changes, that support linguists’ assumptions about the history of English and what linguists think it can tell us about linguistic universals rather than conduct systematic sampling of what was actually going on in the grammar and lexis of the language during this crucial period.

This study is based upon a detailed examination of the auxiliary verbs used in the Paston Letters, a compilation of letters written by and to members of the Paston family, an important part of the landed gentry of Norfolk. The letters begin with those of William Paston I, born in 1378 and died in 1444, and end with those of William Paston IV, born about 1479 and died in 1554. The Paston family letters surveyed begin in 1425 and end in 1495, covering 4 generations of Pastons. The 421 letters written by members of the family amount to approximately 200,000 words of text, exclusive of greetings, closings, headnotes, etc. Equally important are letters written to the Paston family by an assortment of clerks, tenants, lords, jurists, etc., which amount to another 200,000 words.

The letters, which survive in a number of manuscripts, were edited and printed by Norman Davis (1971), Volume I of whose edition is the source text of the present study.

In conducting this study I do not so much stand upon the shoulders of giants as grub in the fertile soil at their feet. Neither the history of English syntax nor the study of English auxiliaries has been heretofore unstudied. Visser (1963–73) is a monumental modern survey of the history of the language’s syntax. Lightfoot (1979, 1991) and Traugott (1972) have, along with many others, made important contributions within the generative tradition. Heine (1993) makes the connection between auxiliaries and grammaticalization. In recent years, Patrick Duffley has presented papers at LACUS on English auxiliaries, especially little studied auxiliaries like *dare* and *need*. Warner (1993) has written a book-length treatment of the history of English auxiliaries, especially quasi-auxiliary constructions like *be* + *going to*. And in a textbook on the history of English syntax, Denison (1993) has produced a very useful contemporary critique of much of the research to date on English diachronic syntax along with the most complete treatment of auxiliaries yet published.

The historical studies of English auxiliaries have not, however, been without their drawbacks. Aside from the tendency of linguists to search the record selectively, attending to data that tended to support their particular theories, there is also the opposite tendency, that of over-inclusiveness. Most historical studies, especially those that, like Denison (1993), have depended on Visser's masterful survey for data, have tended to survey the entire history of the language from Old English (c 450 to c 1150) through modern English, at least Early Modern English (ENE) (c 1450 to c 1650). More significantly, most such treatments take their data where they can find them, which leads to a mixing of literary, everyday, and popular sources. In particular, the inclusion of literary texts, especially poetic texts, as sources of data has led to a distorted view of what was going on in the language at any particular point in time. It is well known that English literature has from time to time perpetuated the survival of words and constructions that had early become all but obsolete. In addition, poetry has always allowed more syntactic leeway than English in everyday use has tolerated.

The present study has the drawback of limiting itself to ordinary letters by one family over a period of some 70 years. But this very limitation, the focus on every line of 670 pages (including textual notes) of ordinary writings by literate, but not literary people, may yield, I think, a more accurate picture of English in this crucial historical period.

First, some interesting side issues that I shall have time only to mention, but which are worth mentioning:

VOWELS. Most historians of English believe that the changes in the quality of the tense or long vowels that have come to be called The Great Vowel Shift began in the 15th Century. Some, in fact, believe that The Great Vowel Shift was all but over by the end of the century. As far as I can see, The Paston Letters provide no evidence that sheds any light on The Great Vowel Shift. Hence, I shall say nothing further of it here. When it comes to lax vowels, however, the situation is fascinatingly cluttered. A simple auxiliary verb like *will* can, in the Paston Letters, be spelled with the vowels *e*, *i*, *y*, *o*, or *u*. The same word can have either one or two instances of the letter *l*. And it may or may not end in a final *e*. Combinatorial possibilities here lead to 20 different ways of spelling *will*, and in the Paston Letters all or most of them occur. *Should* ranges from *xwd* to *scholde* to the modern spelling, with nearly as many possibilities for spelling its vowel as *will*.

The Paston men were literate; some were educated at Cambridge, and at least one attended Oxford. The letters of the women, on the other hand, were written by others, some of whom have been identified as bailiffs and other functionaries employed by the Pastons. What are we to make of the great variation in the spelling of the auxiliaries? It is true that the modern fascination with the fixation of spelling does not begin until centuries later. But when we look at the spellings in the Paston Letters of words like *inquire*, *inform*, *ambassador*, etc., we might conclude that these people were trying to write as they spoke and that the pronunciations of the lax vowels were quite variable at the time.

PRONOUNS. The second person singular. From the Authorized Version of the Bible in the early 17th Century and the practice of Shakespeare, we might conclude that the forms *thou*, *thy*, and *thee*, self-consciously archaic when they appear in the 19th Century in the poetry of Elizabeth Barrett Browning, were maintained in English until the start of Present Day English (after ca. 1650). Generally, most histories of English teach that the second person singular forms persisted well into ENE. However, the Paston Letters cast considerable doubt on this received idea. In 670 pages of text, only two passages contain the second person singular forms. And in both these passages, the writer, a Paston, is quoting someone else, an outsider, probably, in at least one case, not even a native of Norfolk. Otherwise, in 421 letters and other documents *thou*, *thy*, and *thee* are conspicuously absent. No matter what the discourse situation—mother to son, son to mother, son to father, brother to brother, or whatever—the Pastons use *ye*, variously spelled, *your*, and *you* exclusively.

What does this tell us? It might be that the Norfolk dialect simply had discarded the second person singular forms by 1425, but the Paston men, at least, were highly educated for businessmen of their time and probably wrote in a dialect indistinguishable from that of London, where they spent much of their time, suing and being sued. It might be that the conventions of letter-writing, even among family members, dictated the use of plural forms out of respect. Or it might just be that the survival of *thou*, *thy*, and *thee* in literary texts down into the 17th Century has led us to assume that the singular forms survived in ordinary language until then, when in fact they had most likely been dropped much earlier. These three hypotheses are not mutually exclusive: they might all be true. I am inclined, however, given the discourse contexts of the letters studied here, to give most credence to the last hypothesis.

Third person plural pronouns. Readers familiar with Middle English (ME: c. 1150 to c. 1450) will no doubt remember line 18 of The General Prologue to Chaucer's *Canterbury Tales*:

> That hem hath holpen whan that they were seeke.

At other points in the Canterbury Tales we find the third person plural genitive form *hir*. Chaucer's practice here shows that the native English third person plural pronouns *hie*, *hira*, and *heom* were being replaced by the Old Norse forms that eventually led to the PDE forms *they*, *their*, and *them*. In fact, data from Chaucer indicate that by the end of the 14th Century the Viking forms, filtering down from the north and the east, had, in the London dialect, replaced the nominative but not the genitive or the objective (from the OE dative) forms.

Because the Paston Letters were written from one to four generations after the death of Chaucer, we might expect to find a situation at least one generation advanced from Chaucer. That is indeed what we tend to see. In the nominative case *they* is the only form used. In the genitive case *hyr(e)*, with the root vowel variously spelled, tends to predominate, especially in early letters. So that [hər], spelled in various manners, can mean *her*, *here*, *hear*, or *their* depending on context. For the objective case things are more complicated. Both *hem* and *them* occur at various times. I have not completed an exact text count, but my impression is that *hem* is more common in early letters and *them* in later ones.

As I said at the start, the 15th Century was an interesting time both in the history of England and the history of English. The following two examples will give the reader an idea of both the social and linguistic situations of the time.

(1) Moodre, I recomande me to yow, letyng yow wette þat, blyssed be God, my brother John is a lyffe and farethe well, and in no perell off dethe. Neuer the lesse he is hurte wyth an arow on hys ryght arme benethe þe elbow, and **I haue sent** hym a sorion whyche **hathe dressid** hym, and he tellythe me þat he trustythe þat he **schall be** all holl wyth-in ryght schort tyme.
-John Paston II to his mother, Margaret (Mautby) Paston, 1471.

(2) John Grey, othyrwyse callyd John de les Bay, and John Burgeys, they be Yeluertons kapteyns, and they ryd and go dayly, as well in Norwyche as in othyr plasys of yours and othyr menys in the contré, in ther trossyng dowblettys,wyth bombardys and and chaseueleyns, and do what so euer they will in the contré. Ther **dar** no pore man **dysplese** theym, for what so euyr they do wyth ther swordys they make it lawe, and they tak dystrtessys owt of menys howsys, horse or catel or what they wyll, thow it be not on that fee that they ask the dwté for.
-John Paston III to his brother, John Paston II, 1467.

Example (1) contains an occurrence of the most common auxiliary construction found in the Paston Letters, a modal auxiliary followed by a main verb, *schall be*, and the second most common construction, two occurrences of perfect constructions, *haue sent* and *hathe dressid*. Example (2) contains an occurrence of the much

	Modal		Perfect		Progressive		Passive	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Generation I	131	46	65	23	0	0	86	30
Generation II	2655	55	956	20	5	0.1	1176	25
Generation III	2348	58	889	22	22	0.5	757	19

χ^2=25.9 df=6 p<.001

Table 1. Paston letter auxiliaries overview.

more rare construction involving auxiliary *dare*, which I shall not treat in detail in this paper.

More examples of auxiliaries in the Paston Letters follow:

> (3) I gret ȝou well, and lete ȝou wete þat Warne Harman, on þe Sonday after Hallumes Day after ensong, seyd oponly in þe cherch-Jerde þat he wyst wyll þat and þe wall **were puddoun**, þou he were an hondryd myle fro Paston, he wyste well þat I **wolde sey** he **ded** yt and he **xuld bere** þe blame, seying, ‘telle yte here ho so wyll, þou it **xuld coste** me xx nobyllys it **xall be puddoun** aȝen.’
>
> -Agnes Paston to her son, John Paston I, 1451.

In (3) we see examples of more modal+main verb constructions, *I wolde sey he ded yt*, *he xuld bere þe blame*, and *it xuld coste me xx nobyllys*. We also see a passive construction *þe wall were puddoun*, and a combination of modal and passive, *it xall be puddoun aȝen*.

Of the PDE auxiliary constructions, we find many occurrences of three types in the Paston Letters, the ones illustrated above: modals, perfects, and passives. Table 1 gives an overview of the types of auxiliaries found in the data. In an attempt to capture syntactic change in progress, I analyzed the auxiliaries found in the letters of each of 3 generations of the Paston family. The fourth generation is represented by one letter, that by William Paston IV, and is too small a sample to tell us anything of interest.

Table 1 shows a steady increase in the percentages of modal auxiliaries and a steady decline in the percentages of passives. With 9090 auxiliary constructions considered, differences in proportions of modals, perfects, progressives, and passives are significant over three generations (χ^2=25.9, df=6, p<.001).

Examples like (4) and (5) present problems for the history of English auxiliaries.

(4) At þe reuerens of God be ware how ye goo and ryde, for yt **ys told** me þat ye **be thret** of hem þat be nowtty felawys þat **hathe be inclynyng** to them þat **hath be** yowr hold aduersaryys.

(5) It semythe þat the worlde **is** alle **qwaveryng**.

It could be argued that phrases like *be inclining* and *is quavering* could be interpreted as *be* + deverbal adjectives and not as true progressive constructions such as are found in PDE. But in examples like

(6) As I **was wryghtyng** þis bylle Mastresse Jane Harset comandyd me streyghtly that I **shold recomand** hyr to yow in hyr best wyse, and she sendyth yow word she **wold be** as fayne to herre fro yow as an other poore body.

the phrase *was writing* looks very much like a PDE progressive.

Denison (1993) argues that modals were grammaticalized already in OE, as were perfect *have* and perfect *be*, with passive *be* grammaticalized either in OE or somewhere between the Fourteenth and Eighteenth Centuries. For Denison auxiliary *do* was grammaticalized in the Fourteenth or Fifteenth Centuries, and passive *get* in the Nineteenth or Twentieth Century. More problematically, Denison sees progressive *be* as not grammaticalized until perhaps the late Eighteenth Century.

From this study I would argue that the passive *be* construction existed with a fully grammaticalized *be* by the early Fifteenth Century. Auxiliary *do* I shall deal with a bit later. But the progressive construction, with a grammaticalized *be*, appears to be developing before our eyes as the Paston Letters progress through the Fifteenth Century. As Table 1 and Figure 1 show, there are no identifiable progressive constructions in Generation I (William Paston I and his wife Agnes Paston). In the letters of Generation II, with a total of 4792 auxiliaries, there are only 5 constructions that can be optimistically interpreted as progressives (.1%). In Generation III, out of 4016 auxiliaries there are 22 progressives (.5%). These are hardly overwhelming numbers, especially when one considers the prevalence of the progressive construction in PDE, but they do show a significant increase across the generations.

One goal of the present study was to study the development of auxiliary do in the Fifteenth Century. Denison gives the following typology for what he calls 'periphrastic DO' in PDE:

[1] Max didn't see the car.
[2] (a) Did Max see the car?
(b) Scarcely did Max see the car (when . . .)

	Main verb		**Auxiliary**		**Causative**	
	Number	Percent	Number	Percent	Number	Percent
Generation I	22	88	0	0	3	12
Generation II	394	82	2	0.4	83	17
Generation III	388	93	0	0	27	6.5

$\chi^2=11.21$ df=4 $p<.02$

Table 2. *Paston letters* functions of *do*.

[3] (a) (Tim saw the car) and Max did too.
(b) (Tim hardly saw the car.) Nor did Max.
[4] (A. I don’t believe Max saw the car.) B. Max *díd* see the car.

As numerous grammarians have pointed out, PDE auxiliary *do* occurs in negation without auxiliary verbs (Denison’s [1] above), Yes/No questions without auxiliary verbs [2] (a), inversion [2] (b), verbal ellipsis [3] (a) and (b)—sometimes called ‘pro-verb’ do—and emphasis [4]. Some linguists, myself among them, would refer to such sentences as cases of *do* as ‘default modal,’ since it tends to pattern with modals vis-a-vis other auxiliaries.

For Denison, auxiliary *do* was grammaticalized some time in the Fourteenth or Fifteenth Century. But the Paston Letters data do not support Denison’s interpretation. Table 2 shows the distribution of *do* in the data.

In the first place, the situation is not strictly comparable to that of *do* in PDE, where *do* is syntactically either a main verb or an auxiliary (I would argue a ‘default modal’). In OE and ME *do* could function as either a main verb or as a sort of CAUSATIVE auxiliary. Sentences like

(7) As for the enquerré **I haue sent** by Pynchemour to enquere and **sent** myn owen men to William Bakton and ***don*** hem **enquered** in dyuerse places, and I **can here** no word of noon suych enquerans.

illustrate causative *do*, where *do* appears to be grammaticalized to a great extent, conveying only the meaning ‘cause’ or ‘bring about’. Causative *do* is well attested in ME, and it appears quite often in the Paston Letters. Most occurrences of *do* in the data are main verb *do*, but causative *do*, though infrequent, is not absent. The proportions of main verb *do*, causative *do*, and auxiliary *do* (in the PDE sense) vary across the generations of Pastons in interesting ways. Considering 919 occurrences of *do* in the data, proportions of main verb, auxiliary, and causative *do* vary across the generations significantly, with most of the statistical significance accounted for by a much higher frequency of causative *do* than expected in Generation II and a much lower than expected occurrence of the construction in Generation III.

In fact, Table 2 shows that main verb *do* occurs less often than expected (based on the standard cross-tabulation of expected vs. observed frequencies) in Generation II and more often than expected in Generation III. So the frequencies of main verb and causative *do* are mirror images in Generation II and Generation III.

What is even more interesting is the fact that auxiliary *do*, in the PDE sense, does not, for practical purposes, occur in the data. Sentences like

(8) I sent to Cayster that thei **shuld be** ware in kepyng of þe place, as ye **dede wright** to me.

are quite rare. And one could argue that the phrase *did write* could be given either a causative or a (modern) auxiliary interpretation. Given that (8) occurs in a letter from Margaret Paston to her son, John Paston II, who tended to write his own letters, I am tempted to interpret it as an auxiliary, although not one that is commonly used in standard PDE. Still, the phrase could be interpreted as a causative, and I find only 2 phrases where I would even optimistically interpret *do* as an auxiliary in anything like the PDE sense. And as Table 2 shows, I find no clearcut cases of PDE auxiliary *do* in Generation III. In short, I would argue that Denison's timetable for the grammaticalization of *do* is optimistic.

Loose ends. Sentences like

(9) For **had** nott yit that danger **have been**, I **myght** yit **have ben** at home wyth yow at thys daye or wyth-in vij dayes afftre.

with the phrase *had not yet that danger have been* and

(10) And more ouyre he **hathe reportyd** hymselff off Syr Wylliam Yeluerton þat he **hathe** not **delt** wyselye and that he **hathe auenturyd**, for malyse of me, hys welffare; and he ***had kowde haue knowen*** what he **hadde don**, but he seyd he was not wyse, seyng that and I **hadde recuueryd** ageyn hym in the Chacerye that he wer verrely ondon.

with *he had could have known* appear to be a sort of 'double perfect,' although the first occurrence of *have* is followed in (9) not by the past participle of *have* but by the bare infinitive form, and in (10) had is followed by a modal, which is in turn followed by another perfect construction.

In any case, such constructions are rare. What is infrequent, but more common are cases of so-called 'double modals,' much like those found in Southern U.S. PDE.

(11) I suppose if ye lyde to bye itt when ye com hom ye **shall mou have** itt of Toppis als gode chepe or bettere than anoþer shuld.

(12) James Gresham **shall cone telle** where ye **shall** best **inquere**, and such as ye **can knowe** send me iustly word.

Eight phrases with such 'double modals' occur in the data. Although numerous dialectologists familiar with Southern U.S. dialects have pointed out that only one of the two 'modals' in such constructions behave like true modals, their precise syntactic characterization remains in doubt. More important, their presence in these Fifteenth-Century data suggests that phenomena like these are not new to English.

Clearly, the Paston Letters constitute an interesting source of data for the historical syntax of English. A much more detailed analysis of these data must await another paper.

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❧

SMALL CLAUSES AND INDIRECT DISCOURSE IN LATIN PROSE

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Traditional views of Latin grammar,[1] including Transformational Grammar and to some extent Functional Grammar, have typically regarded the choice between predicates with direct object plus predicate accusate and predicates with accusative-plus-infinitive as being driven by the properties of the governing verb. According to this viewpoint, certain verbs subcategorize for Small Clause predicates, and others subcategorize for Raised predicates. In this paper, it will be shown that this analysis is inadequate, since even the most common Latin authors do not follow these predictions.

Construction Grammar[2] proposes that syntactic constructions exist as entities independent of the lexical items which fill them. The semantics associated with said syntactic constructions combine with the semantics of the lexical terms which fill them to determine the meaning of the sentence as a whole. This viewpoint is opposed to the traditional viewpoint which held that syntactic constructions are licensed by the subcategorization properties of specific verbs or classes of verbs.

In this paper, I will apply this central proposition of Construction Grammar to explain the distribution of *esse* in Latin statements in Indirect Discourse. Specifically, I propose that Indirect Discourse statements are licensed by two separate constructions, each with its own semantics. One construction, consisting of a direct object plus predicate accusative (roughly parallel to the so-called small clause), implies that the subject of the governing verb has a high degree of involvement with the proposition in the predicate. The other construction, consisting of an accusative subject plus an infinitival phrase, implies a degree of independence between the subject and the predicative proposition. These usages are roughly parallel to the distinctions between full sentential clauses and small clauses in English sentences of proposition, as discussed at length by Borkin (1984).

Due to constraints of space, not all the pertinent aspects of the topic can be discussed here. Hence, the scope of this paper will be limited to a semantic approach. Discourse Analysis cannot be attempted here, and no particular syntactical representation is assumed here, except for what is implicit in Construction Grammar.

The subcategorization of Small Clauses and Indirect Discourse. Caesar's commentaries and Cicero's orations have long been used as primer texts for beginning students of Latin. They are considered easy to read because they use regular, unexceptional grammar (no doubt due in part to heavy editing). They 'follow the rules', which is to say, they conform to the generalizations found in reference grammars, such as *Allen and Greenough's New Latin Grammar* (Allen & Greenough 1980).

However, even such basic authors as Caesar and Cicero 'break the rules' on a few grammatical points—not only occasionally, but regularly. One of these points is the type of predicate which is allowed to follow certain verbs. Allen and Greenough (1980:244, 290, 374) draw a distinction between verbs which govern a direct object with an accusative complement, on the one hand, and those which govern an embedded infinitival clause with accusative subject, on the other:

> 393. Verbs of naming, choosing, appointing, making, esteeming, showing, and the like, may take a Predicate Accusative along with the direct object:
>
> *Cicerōnem cōnsulem creāre*, to elect Cicero consul.
> *mē augurum nōmināvērunt* (Phil. ii. 4), they nominated me for augur…
>
> 540. The infinitive with Subject Accusative is used with verbs and other expressions of knowing, thinking, telling, and perceiving (Indirect Discourse, §579)…
>
> *nōn arbitror tē ita sentīre* (Fam. x. 26. 2), I do not suppose that you feel thus.
> *spērā mē līberātum [esse] dē metū* (Tusc. ii. 67), I trust I have been freed from fear.

These two constructions—the direct object with Predicate Accusative and the Infinitive with Subject Accusative—bear a close resemblance to what Transformational Grammar refers to as Small Clauses and Subject-to-Object Raising, respectively.[3] In TG, Subject-to-Object Raising is felt to be the exceptional ability of a certain set of verbs which subcategorize for that construction—the Exceptional Case Marking verbs (see Ouhalla 1994:172–73). Pinkster (1990), in his Functional Grammar analysis of Latin syntax, does accord the Predicate Accusative and the Infinitive-plus-Accusative some status as constructions in their own right, at least insofar as the same construction appears with many verbs. However, the relationship between verb and construction is left unclear. By implication, Pinkster follows Dik (1978:29ff) in subsuming these constructions into the predicate-frames of the verbs with which they appear.

In short, traditional grammars, TG, and FG all relegate the assignment of Predicate Accusatives and Infinitive-plus-Accusative clauses to separate classes of verbs. Verbs that affect or change their direct objects by means of a 'speech act' (such as naming, choosing, making, and the like) are said to govern direct objects with Predicate Accusatives (hereafter called Small Clauses, or SC). Verbs of percep-

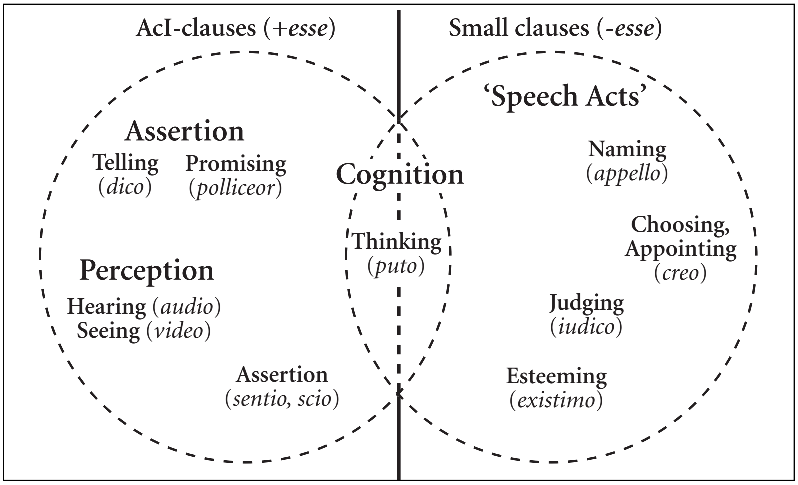

Figure 1. Distribution of SC and AcI-clauses according to traditional grammars.

tion and assertion, on the other hand, are said to govern Infinitive-plus-Accusative clauses (hereafter called Accusativus cum Infinitivo or AcI, following Pinkster, Bolkestein, et al.). Verbs of cognition such as *puto* 'think, consider' may be considered either verbs of esteeming (thus governing SC) or verbs of thinking (governing AcI). Allen and Greenough (1980) list *puto* under both categories.

PROBLEMS WITH SUBCATEGORIZATION. In order to investigate the distribution of Small Clauses and AcI-clauses in Classical Latin prose, I examined four texts by three authors: the first book of Caesar's *Bellum Civile* (hereafter BC), Cicero's first two orations against Catiline (Cat. I *&* II), and Suetonius' *Nero*.[4] All examples of the 'speech act' verbs (naming, choosing, etc.) were found to govern SC, as in the example (1), confirming Allen and Greenough's assertion. However, causative verbs which do not involve 'speech acts' appear to have the same construction, as in (2).

(1) *mensem quoque Aprilem*$_i$ ***Neroneum***$_i$ *appellavit.*
month.ACC also Aprili.ACC **Neroneus$_i$.ACC** call.3SG.PAST
'He also called the month of April Neroneus' (*Nero* 55.1.4)

(2) *quin etiam principes eius ordinis partem*$_i$ *illam*
why, even leaders.ACC this.GEN order.GEN parti.ACC that.ACC
subselliorum ad quam ille accesserat ***nudam***$_i$
benches.GEN to which he.NOM approach.3SG.PLUP **bare$_i$.ACC**
atque inanem$_i$ *relinquerunt.*
and empty$_i$.ACC leave.3PL.PAST

(2) 'They went further; the most senior members of the House left empty and bare the benches around that upon which he had seated himself'(Cat II 12.13).

Moreover, verbs of knowing, thinking, telling, and perceiving do not always govern AcI-clauses as predicted. When the embedded infinitive is a simple verb, such as the present active infinitive *sentire* quoted above, the rule is generally followed. But if the embedded infinitive is *esse* 'to be', or any compound verb containing *esse*, then the *esse* is often omitted, resulting in a structure identical to the SC expected for verbs of causing. This occurs not just with verbs of cognition like *puto*, but also with verbs of perception and assertion. (Subscripts such as $_i$ and $_j$ are used to indicate agreement between antecedents and modifiers which are separated by clausal boundaries.)

(3) *ut vero* *consulto* *Delphis* *Apolline*
as indeed consulted.PPP.ABL Delphi.LOC Apollo.ABL
septuagensimum ac tertium *annum*$_i$ ***cavendum***$_i$
seventieth-and-third.ACC year$_i$.ACC **to-be-bewared**$_i$**.FPP.ACC**
sibi *audivit*
REFL.DAT hear.3SG.PAST
'And after consulting the oracle at Delphi and being told (=having heard) that he must look out for the seventy-third year…' (*Nero* 40.3.1)

(4) *solos*$_i$ *scire* *audire* *Graecos*$_i$ ***solosque*** *se*$_i$ *et*
only$_i$.ACC know.INF hear.INF Greeks$_i$.ACC **and-only.ACC** refl$_i$.ACC. and
studiis ***suis*** ***dignos***$_i$ *ait*
studies.DAT **his.DAT** **worthy**$_i$**.ACC** say.3SG.PAST
'He declared that the Greeks were the only ones who had an ear for music and that they alone were worthy of his efforts' (*Nero* 22.3.10).

(5) *tu…* *agnoscas* *odium*$_i$ *omnium* ***iustum***$_i$ ***et*** ***iam***
you.NOM know.2SG hate$_i$.ACC all.GEN **just**$_i$**.ACC** **and** **already**
diu ***tibi*** ***debitum***$_i$
long **you.DAT** **due**$_i$**.ACC**
'Yet, you, recognizing as you do… that the universal hatred you attract is justified and has long been your due…' (Cat I 17.6)

As examples (3)–(5) show, Small Clauses and AcI-clauses are not neatly distributed to particular verbs or classes of verbs. In fact, nearly all the major verbs of knowing, thinking, telling, and perceiving in these four texts govern both SC and AcI-clauses. Of the ten most frequently attested verbs, eight of the ten verbs govern

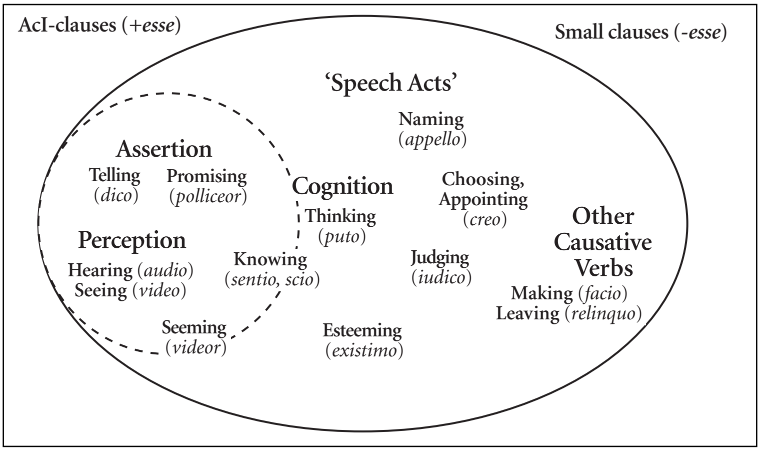

Figure 2. Distribution of SC and AcI-clauses in the four texts.

both SC and AcI, in varying proportions. Only two verbs (*existimo* and *iudico*) govern only one type of predicate, and examples of the other type can be found for both verbs among other works by these same authors.[5] Hence, the usage of these verbs may also be conceptualized as in the diagram shown in Figure 2.

The use of SC with verbs of perception, cognition, and assertion, although frequent in all three authors, has received little attention from either grammarians or linguists. Bolkestein (1976b:286, footnote 30) considers this use of the SC identical to the AcI construction, the infinitive (*esse*) having simply been left unexpressed. Allen and Greenough (1980:314 §498a) implicitly support this view, noting that the periphrastic future active infinitive often omits the *esse*, leaving a bare participle. They moreover show examples of similar omission with the perfect passive infinitive, supplying the *esse* in brackets.

(6) *spero* ***me liberatum [esse]*** *de metu* (Tusc. ii. 67), I trust I have been freed from fear (1980:374).

However, neither Allen and Greenough nor Bolkestein attempt to explain why this omission is so common. Nor do they address similar omissions in the future passive infinitive and with adjectival predicates. Pinkster (1990:275–6, endnotes 54, 80) says nothing of this construction, apart from commenting on certain historical implications it is claimed to have. Hahn (1950:12) considers it an 'ancestor' of the AcI construction, but gives no account for its continued occurrence alongside AcI even into later Latin. Yet Suetonius, writing nearly two hundred years after Cicero and Caesar, uses SC more frequently than either of them.

Parallel constructions with English propositional verbs. Thus the traditional subcategorization viewpoint that the choice between SC predicates and AcI predicates is primarily dependent on the verb does not match the data found in Caesar, Cicero, and Suetonius. Borkin notes a similar alternation in English, more complex than the Latin situation—where independent clauses with and without *that*, Raising constructions, and Small Clauses all may join a verb with a propositional object:

(7) a. I believe that Jim is self-serving
b. I believe Jim is self-serving
c. I consider Jim to be self-serving
d. I consider Jim self-serving (1984:7).

However, the semantic nuances of these several constructions are not identical. Rather, they form a continuum relative independence between the proposition and the governing clause. As Borkin puts it, 'Generally, the more the predication in the underlying object complement is viewed as true or false independently of the control or perception of the subject of the Raising verb, the less likely it is that the structure of the complement will be broken up by Raising and then *to-be* deletion' (1984:83). Aarts (1992) challenges the notion of a *to-be* deletion rule, but supports Borkin's semantic generalizations.

Different verbs manifest this general semantic shift in slightly different ways. For example, with verbs of perception or judgement, Raised predicates and Small Clauses are more likely to be reports of personal perception, rather than statements of objective fact or reported (indirect) findings. Among the following sentences, Borkin notes that she expects (8) to be a report of consumer reaction tests, but (10) to be a statement of how the chair feels to the speaker.

(8) I find that this chair is uncomfortable.
(9) I find this chair to be uncomfortable.
(10) I find this chair uncomfortable. (Borkin 1984:79)

With verbs speaking or asserting, the Small Clause construction suggests a causative reading of a verb, in which the complement describes a change in status caused by the action of the governing verb.

(11) a. The judge declared Mary Schultz (to be) insane.
b. %Mrs. Grass declared Mary Schultz to be insane (Borkin 1984:80–81, % indicates a difference in meaning).

The contrast in Latin is simpler than the gradient in English, as there is no common equivalent of the sentential construction, with or without *that*. Given the data from Cicero, Caesar, and Suetonius, it is clear that verbs which allow propositional clauses allow them both with and without *esse* ‘to be’, just as the English examples above allow several distinct propositional constructions. By analogy, it seems reasonable that a similar semantic distinction may exist between clauses with and without *esse* in Latin. An examination of the works mentioned above tentatively supports this theory. The remainder of this paper will explore the evidence for these semantic differences as found in Caesar, Cicero, and Suetonius. The next three sections will examine the use of Small Clauses and AcI-clauses with verbs of perception, assertion, and cognition, in turn.

SEMANTIC DISTINCTIONS WITH VERBS OF PERCEPTION. With verbs of perception, the Small Clause usually indicates the direct perception of an event. Other forms of Indirect Statement, such as AcI-clauses, may suggest that the knowledge about an event is gained though indirect observation, or through another’s report of the event.

(12) *audiit…* *etiam* *ex* *obviis* *viatoribus*
hear.3sg.past… also out-of in-the-way.abl wayfarers.abl
quendam$_i$ ***dicentem***$_i$***:*** *‘Hi* *Neronem* *persequuntur’,*
one$_i$.acc **say$_i$.pap.acc** these.nom Nero.acc pursue.3pl
alium$_j$ ***sciscitantem***$_j$*,* *‘Ecquid* *in* *urbe* *novi*
other$_j$.acc **inquire$_j$.pap.acc** anything in city.abl new.gen
de *Nerone?’*
about Nero.abl
‘He also heard one of the wayfarers whom he met say: “These men are after Nero”, and another ask: “Is there any thing new from the city about Nero?”’ (*Nero* 48.2.2).

(13) *audierat* *Pompeium*$_i$*…* ***confestim*** ***esse***
hear.2sg.plup Pompey$_i$.acc… **very-soon** **be.inf**
venturum$_i$.
about-to-come$_i$.fap.acc
‘He had heard that Pompeius ... would very soon arrive’ (BC 1.39.3.2).

In the first of these two sentences, Nero overhears two travelers in the act of conversation, hearing their exact words. The use of the present participles *dicentem*, *sciscitantem*, rather than present infinitives, emphasizes the fact that Nero is present at the time of the action (see Allen and Greenough 1980:314, §497d).

In sentence (13), however, it is impossible for Caesar to hear Pompey about to come—future actions make no noise in the present. The *esse* in (13) implies that what Caesar heard was a *report* that Pompey was about to arrive (see also Bolkestein 1976).

Semantic distinctions in verbs of assertion. With verbs of assertion (telling, claiming, promising, etc.), the Small Clause implies personal involvement with the state of affairs described in the predicate. It may denote a speech act which causes the proposition to come about, as in (1), or it may be the statement of a strong personal opinion, as in (4). It may also imply an intention to bring about the state of affairs in a future time, as with the verb *polliceor* 'promise.' Conversely, Indirect Statement with AcI denotes an assertion of a state of affairs as fact, presumed to exist independently of its assertion.

Sometimes the choice between the sc and the AcI will change the meaning of the governing verb from a literal to a figurative interpretation. In example (14), *polliceor* with the sc connotes that the speaker binds himself to a certain obligation. However, the AcI-clause in (15) carries no such implication.

(14) *Caesar…* *se*$_i$ ***frumentum*** ***daturum***$_i$ *pollicetur*
Caesar.nom refl$_i$.acc **grain.acc** **about-to-give$_i$.acc** promise.3sg
'Caesar promises to provide them with corn…' (bc 1.87.1.1)

(15) *ad hunc* *impendiorum* *furorem…* *impulsus* *est*
to this.acc expenses.gen flurry.acc… driven.ppp.nom be.3sg
ex indicio *equitis*$_i$ *R[omani]* *pro* *comperto*
by evidence.abl knight$_i$.gen Roman.gen for certain.abl
pollicentis$_i$ *thesauros*$_j$*…* ***esse*** ***in*** ***Africa***
promising$_i$.pap.gen treasuresj.acc… be.inf in Africa.abl
vastissimis ***specubus*** ***abditos***$_j$***.***
huge.abl caves.abl hiddenj.ppp.acc
'He was led to such mad extravagance… by the assurance of a Roman knight, who declared (= promised) positively that… enormous wealth… was hidden away in huge caves in Africa' (*Nero* 31.4.2).

In example (14), Caesar declares his own intentions, for which no external evidence need exist. Moreover, Caesar changes his own state of affairs by putting himself under obligation to bring to pass the predicate *Caesar will give grain*. The consequent dependence of the proposition on Caesar's action motivates the use of the sc here. This is the typical meaning of *polliceor*. Indeed, nine out of the twelve instances of *polliceor* in these three texts are found with Small Clauses. All of these instances have the reflexive pronoun as the subject of the sc. By contrast, only one of the three instances of *polliceor* with the AcI-clause has the reflexive pronoun as the subject. This contrast seems to reflect a greater independence between the subject and proposition with AcI-clauses.

In sentence (15), above, this feeling of independence overrides the usual meaning of *polliceor* and allows a more extended meaning of the verb. The knight's 'promise' does not bind him to a particular action, and thus does not change his state of affairs. Nor does it affect the truth of the predicate. The facts he asserts, if true, were true long before his 'promise', and would be provable by independent empirical evidence.[6]

SEMANTIC DISTINCTIONS WITH VERBS OF COGNITION. With verbs of cognition (thinking and esteeming), the difference may be subtler, and both alternatives may be equally acceptable. However, the nuances are still different. The SC emphasizes the subject's (subjective) opinion. As with verbs of assertion, the use of Indirect Statement makes the judgement more detached, suggesting that it is a fact acknowledged by others.[7]

Verbs of cognition may also suggest a decision to act. A SC predicate will often signal that the opinion indicated by the verb leads to corresponding action, as in (16).

(16) *ea res saepe temptata etsi impetus*
this.NOM thing.NOM often tried.PPP.NOM thus actions.ACC
eius consiliaque tardabat, tamen omnibus
his plans.ACC-and delay.3SG.IMP nevertheless all.ABL
rebus ***in eo perservandum*** *putabat.*
things.ABL **in this to-be-persisted.FPP.ACC** think.3SG.IMP
'His frequent attempts at an understanding were hindering energetic action and policy, yet on all accounts he thought it right to persevere therein' (BC 1.26.3.5).

(17) *quem$_i$ quidem ego hostem$_i$, Quirites, quam*
Whom$_i$.ACC$_i$ even I.NOM enemy$_i$.acc$_i$ citizens.VOC how
vehementer foris ***esse timendum$_i$***
strongly out-of-the-city **be.INF to-be-feared$_i$.FPP.ACC**
putem, licet hinc intellegatis,
think.1SG.SUBJ may.IMPRS from-this understand.2PL.SBJ
quod etiam illud moleste fero quod ex
that even this.ACC hard bear.1SG that out-of
urbe parum comitatus exierit.
city too-small following.NOM go-out.3SG.PAST.SBJ
'You may judge, too, citizens, how formidable (=how strongly to be feared) an enemy I consider him to be, now that he has left the city, from my concern that he left Rome with so few companions' (Cat. II 4.6).

In Latin, future passive participles not only say that something is about to be done, but also imply that it *ought* to be done (Allen and Greenough 1980:315, §500). In (16), Caesar thinks a certain course of action worth persisting in. However, he is not emphasizing this verdict as a mere opinion or wish, but rather as a decision to act in a certain way. Thus, the action of the verb (thinking, but also deciding) affects the truth value of the predicate (which, using the future passive participle's original meaning, may also be rendered, 'The action will be persisted in'). When verbs of cognition like *puto* govern predicates which contain future passive participles (such as *perservandum* 'needing to be persisted in'), the reported thought usually followed up by action. Thus, of the seven instances where *puto* governs a future passive participle, all but one appear in a Small Clause.

The one exception, sentence (17), finds Cicero not directly contemplating action, but in the midst of defending and explaining his position to the Roman people. When he talks about how much he considers Cataline (to be) a foe to be feared, it is not the prelude to a decision to act. On the contrary, Cicero cannot act until the proposition *Cataline is a formidable enemy* is no longer just Cicero's personal judgement, but an incontrovertible fact in the eyes of all Rome—which entails waiting for Cataline to act. The *esse* emphasizes the proposition as open fact, which viewpoint Cicero encourages with the preceding sentence: 'I therefore created a situation in which you could see your enemy clearly and fight him in the open' (Cat. II 4.4). Accordingly, the *esse* focuses the sentence not on the results of the judgement, but the evidence for the judgement, which Cicero produces throughout his speech. Caesar's decision in (16), by way of contrast, is if anything contrary to the evidence he presents, not occasioned by it.

Quantitative trends in the corpus. The semantic distinctions which I have briefly illustrated here do not constitute hard and fast rules. Rather, they are principles that can be used to explain trends imperfectly predicted by rules. Not all the examples in the three works examined neatly follow these generalizations. In some, other rhetorical devices may take precedence. For example, sentence (18) seems to buck the trend.

(18) *Pompeius…* *rescripserat:* *sese*$_i$ *rem*
Pompey.NOM… write-back.3SG.PLUP refl$_i$.ACC thing.ACC
in *summum* *periculum* ***deducturum***$_i$ ***non*** ***esse***
into highest peril **lead-down**$_i$**.FAP.ACC** **not** **be.INF**
'For Pompeius had sent back word that he would not utterly imperil the whole situation' (BC 1.19.4.1).

Usually verbs of assertion with reflexive pronouns and future participles in the predicate govern Small Clauses, without *esse*. It seems the *non esse* at the very end is a rhetorical device of its own, almost a sarcastic tag ending: 'Me—lead my whole campaign into the highest danger? It's not happening'. Since the *non* cannot be placed at the end of the sentence without the *esse*, the *esse* is necessary in order to obtain the desired effect.

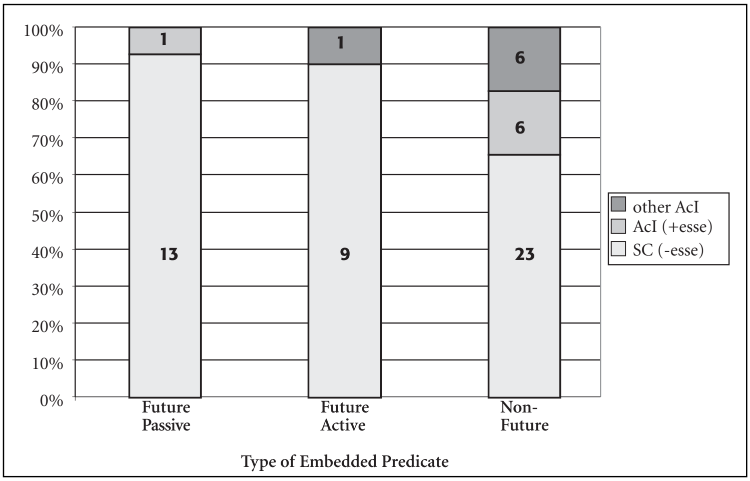

Figure 3. Future and non-future participles with verbs of cognition.

In spite of these instances, there are some trends which can be observed to apply generally throughout the texts. Some of these have already been mentioned. For instance, in the section about verbs of assertion, it is predicted that verbs of promising with reflexive pronouns will usually take SC predicates, since the act of promising binds the one promising (the subject) to do what he promises (i.e., perform the predicate). Sure enough, nine of the ten instances of *polliceor* with a reflexive pronoun govern SC. The two instances of *polliceor* without a reflexive pronoun both govern an AcI-clause, showing a greater detachment from what is 'promised'.

It was also observed that verbs of thinking or esteeming would be more likely to govern SC predicates if these predicates contain future passive participles, representing a decision to perform a certain action. Also, just as with *polliceor*, so these verbs often use the future active participle to show intended action. Accordingly, only one of the fourteen verbs of thinking with a future passive participle (7%), and one of the ten with a future active participle (10%), govern an AcI-clause. Twelve of the thirty-five verbs of thinking without a future participle (35%) govern AcI-clauses. (See figure 3.)

Finally, with all verbs discussed in this paper, the use of SC places emphasis on the subject of the sentence as highly involved with the fulfillment of the predicate. Very often, this correlates to a general focus on the subject. In Latin, when the subject is first or second person, it may also receive emphasis by the explicit use of a subject (nominative) pronoun. These two types of emphasis (i.e., the emphatic personal pronoun in the subject and the SC in predicate) were found to reinforce each other. Figure 4, using findings from Cicero's Cat. I & II, shows this tendency.

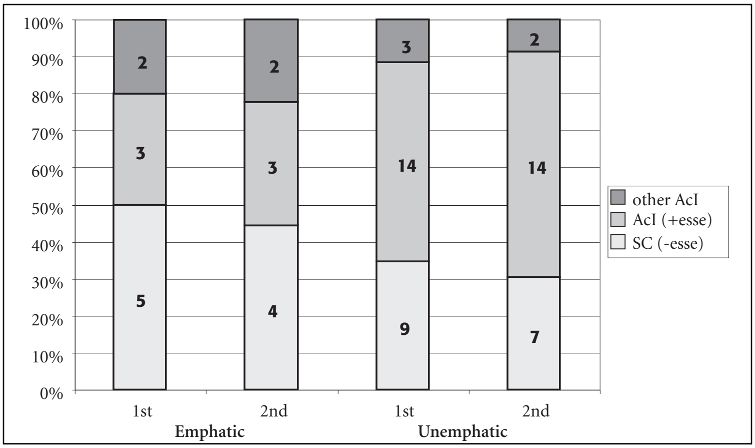

Figure 4. Emphatic and unemphatic pronouns in Cicero's *In Catilinam* I & II.

Construction Grammar and the semantics of constructions. To sum up my main points so far:

- Propositional verbs of perception, assertion, and cognition appear both with and without *esse* in Cicero, Caesar, and Suetonius, violating subcategorization rules implied in Allen and Greenough (1980).
- The existence of two syntactic patterns for the expression of a proposition in Latin parallels the existence of several propositional-object patterns in English, which Borkin (1984) showed to be motivated by subtle semantic differences.
- Both anecdotal and quantitative evidence suggests that there may be similar semantic distinctions in Latin which motivate the distribution of Small Clauses and AcI-clauses.
- In both Latin and English, the difference seems to be one of relative independence between the proposition and the governing subject: the more independent the proposition from the maker of the proposition, the more likely the proposition is to remain an independent syntactic unit, with *esse* or 'to be'.

These differences in form and meaning can be accommodated without sacrificing the subcategorization viewpoint. One must simply postulate two senses for every proposition-type verb, one which subcategorizes for Small Clauses, and one for AcI-clauses. However, this approach multiplies unnecessarily the verb senses which must be accounted for in the lexicon, and does not capture the general tendencies above, which apply to many verbs.

A different viewpoint is offered in Construction Grammar, as exemplified by Adele Goldberg (1991, 1995). Construction Grammar holds that grammatical constructions, such as Small Clauses and AcI-clauses, are not merely subcategorization frames licensed by particular verbs. They have independent meaning, which com-

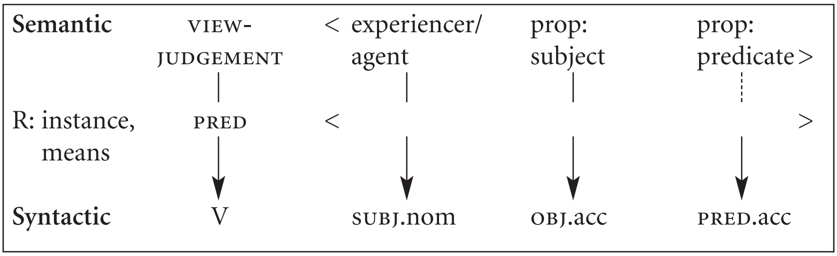

Figure 5a. The ‘Small Clause’ Construction: agent views proposition as a subjective judgement. For example, ‘I judge this the most valuable book in my collection’, i.e., it’s the best one, *in my opinion*. Dotted lines, here and in figure (5)b indicate an addition made by the construction to the syntax of the clause. (Both (5)a and (5)b are adapted from Goldberg 1995:50, figure 2.4.)

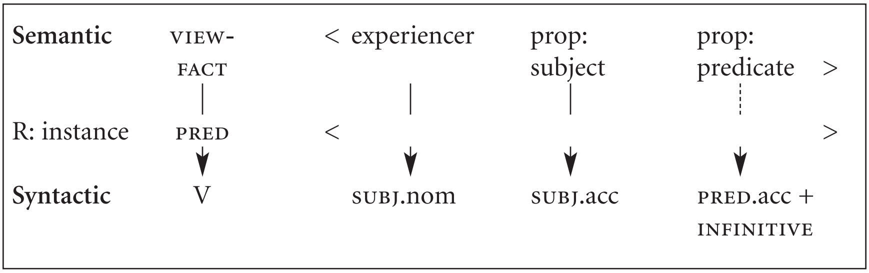

Figure 5b. The ‘AcI Clause’ Construction: agent views proposition as an objective fact. For example, ‘I judge this to be the most valuable book in my collection’, i.e., it’s the best one, *in an objective, verifiable sense*.

bines with the meaning of the verb and its lexical arguments to alter the interpretation of the final sentence.[8]

The Construction Grammar approach avoids the redundancy, and captures the generalization. We may postulate the existence of two separate constructions, one with *esse* and one without. The semantics of the two constructions, based on the independence between proposition and the one who proposes it, may be partially motivated by the iconicity of the forms: two clauses imply two independent propositions; one clause implies a close connection, approaching one unified thought. These two constructions may be visualized as depicted in figures (5)a and (5)b.

Specifically, it is here tentatively suggested that Latin verbs of perception without *esse* suggest a more direct perception, as in (12); that verbs of assertion without *esse* may denote the speaker’s intention to ‘make his words good’, as in (14); and that verbs of cognition without *esse* suggest a more personal judgement and/or a judgement which is to be acted upon, as in (16). However, the several shades of meaning apparent in the Small Clause construction need not pose a problem for the theory—Construction Grammar allows for polysemy in constructions just as it does for words. These variations on the basic construction may be postulated as separate constructions, motivated by the main construction, and linked to it through polysemy links (see Goldberg 1995:75).

THE SMALL-CLAUSE CONTSTRUCTION AND VERBS OF CAUSING. Up to now I have not discussed the relationship between verbs of perceiving, speaking, and thinking, which may or may not be closely tied with their predicate, and verbs of naming, choosing, and other verbs which by their nature effect a change on their predicates. I observed, however, that the traditional descriptions of Latin grammar accurately predicted that these verbs would always govern a SC in preference to an AcI-clause.

The similarity in syntactic form between propositional verbs in the Small Clause construction and the construction used with verbs of causing may be explained by the notion of inheritance, as discussed in Goldberg (1995:72ff). The grammatical construction SC implies that the subject of the governing verb caused (or was somehow involved in) the state of affairs described inside the SC. Although the SC still contains a proposition, the semantics relationship between the verb and the proposition are very similar to the semantic relationships between causative verbs and their objects. It is quite possible that the Small Clause construction with propositions inherits both syntactic and semantic properties from the causative construction. Through this inheritance link, both constructions would motivate each other.

The AcI-clause, on the other hand, implies the opposite: namely, that the state of affairs described exists independently of the governing clause. This implication is incompatible with the inherent meaning of verbs of naming, choosing, and causing, for these verbs entail that the subject caused the state of affairs in the predicate. Therefore, verbs of causing will rarely (if ever) appear with the AcI construction.

CONCLUSION. Traditional Latin grammar, exemplified here by Allen and Greenough, along with TG and FG, divide verbs governing SC and verbs governing other forms of embedded predications (such as AcI) into two separate categories. A small set of verbs, such as *puto*, are allowed in both categories, since they are presumed to have two different senses (thinking and esteeming). However, the data here examined, as well examples given by Greenough himself, show that virtually any verb of indirect discourse can also govern SC. The division between SC and AcI is a semantic one, for these grammatical forms carry meaning and affect the interpretation of the final sentence. Any restrictions on a verb governing either SC or AcI will be a result of incompatibility between the intended meaning of the verb and the semantics carried by the grammatical constructions SC or AcI.

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[1] I would like to thank Dr. Roger Macfarlane for consultation with the Latin, and Dr. Alan Manning making me aware of Construction Grammar, and both for their encouragement and patience.

[2] For an introduction to Construction Grammar, see Adele Goldberg (1995).

[3] The main difference between Raised predicates in TG and AcI constructions in Latin is in their passivization. While Raised predicates always raise to Subject and receive Nominative Case when passivized, the AcI construction may either take Nominative or remain in Accusative (see Bolkestein 1981a:90, Pinkster 1990:130). However, this difference is irrelevant to this paper, since both of the constructions are presumed to be licensed by a certain class of verbs.

[4] The English translations are from The Loeb Classical Library, unless otherwise noted.

[5] *existimo*: Caesar BG 1.41; BG 6.13. *iudicio*: Caesar BG 1.45; Cic. *de Orat.* 2.281.

[6] A similar figurative use of *promise* is found in English:
I promise (that) the bread is baking in the oven.

[7] Although the distinction between clauses with and without *esse* with verbs of cognition is similar to Jakobson's notion of *evidential* (Jakobson 1971:135), the distinction is maintained with other types of verbs where evidential typically does not apply, e.g., in verbs of judging or speech.

[8] This is not meant to imply that Construction Grammar stands alone in this regard. An anonymous reviewer noted that Stratificational Grammar may also provide an interesting account of the data presented here (see Sullivan 1980). However, it is not possible to explore all possible grammars here, but only to assert that the data are generally supportive of Construction Grammar's account.

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IX. APPLIED LINGUISTICS
&
LANGUAGE CONTACT

ASSUMPTIONS, HYPOTHESES, AND THEORIES IN ‘APPLIED’ VS. ‘THEORETICAL’ LINGUISTICS

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Although what our students continue to hear in introductory textbooks in our field is that linguistics is ‘the scientific study of language’ (see, as but one recent example, Macaulay 1994), a number of researchers have provided convincing evidence and arguments to show that this may simply not be the case. Some of the most powerful arguments are found in Botha (1970), Itkonen (1978, 1981), and Yngve (1986, 1996). I have spoken to a number of colleagues who are struck by the contrast in so-called ‘applied’ and ‘theoretical’ linguistics. (All, incidentally, consider themselves ‘applied’ linguists of one sort or another.) Here I take a sideline to the discussion in Yngve (1986, 1996). I argue elsewhere (Coleman 1997a) that the difference between the two is not so much that between ‘theory’ and ‘application’ as between two communities studying the same ‘object’ (language) with totally different approaches. Each is grounded primarily in a different historical tradition (philosophy and the social sciences, respectively).

These different traditions do not use the same kinds of things as evidence, for example. Philosophers (and by this I mean logicians, mathematicians, and computational theorists, among others) argue from a set of agreed-upon axioms. In effect, the axioms are their basic ‘evidence’. A proof of the truth of any particular proposition can be established on the basis of logical argument from such axioms. Social scientists, on the other hand, have tried to follow the methods of the natural sciences which came before them. Those fields established a system of inquiry in which the truth of a proposition (a hypothesis) is established only by comparison with observable events in the physical world. (It should be noted that neurolinguistics, in contrast to all other subfields of linguistics, falls directly within the natural sciences.)

All linguists appear to use the lexicon of science. Texts in both theoretical and applied linguistics include terms like *observation* and *data*, for example. The question is whether both groups are using these terms in the same way. If, as Yngve (1986, 1996) and others cited above have argued, theoretical linguistics plays by the rules of philosophy, not science, then theoretical linguists, in the main, have coopted the lexicon of science rather than adopted it.

1. Why this research is not within the area of 'genre studies'. There is a fatal circularity problem with the prevailing definitions of 'genre'. Note, for example, the circularity in Swales' (1990) definitions of 'genre' and 'discourse community'. He defines a discourse community (1990:24) by stating that it 'utilizes and hence possesses one or more genres in the communicative furtherance of its aims'. This statement specifies one of six 'necessary and sufficient… defining characteristics' (26) of a discourse community. Now note the definition of a genre offered later in the same work (Swales 1990:58):

> A *genre* comprises a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent *discourse community*… [emphasis mine].

This problem of circularity is basically analogous to the one introduced by Bloomfield (1933:78) when he said, 'in every speech-community, some utterances are alike in form and meaning'—referred to by Yngve (1996:32) as Bloomfield's 'fundamental assumption of linguistics'.

This problem can be avoided. Saville-Troike (1989:17) makes the following suggestion with regard to this sort of problem:

> If circularity is to be minimized, ethnographers of communication should begin with an extra-linguistically defined social entity, and investigate its communicative repertoire in terms of the socially defined community.

This approach is not unfamiliar, and can be seen in much earlier work, the most well-known example being the definition of the relative social status attached to three department stores in Labov's (1972) exemplary (and now 'classic') study of the social stratification of post-vocalic [r] in New York City. It is essentially the kind of approach that Yngve (1996) also suggests, though the way that Saville-Troike follows up on it may not be compatible with his views.

In any case, I am not really interested in characteristics of genres, but in those of people and in their activities. The people in question are those writing in 'theoretical' linguistics vs. 'applied' linguistics. The corpora drawn from those fields are being analyzed for what they show about the writers and their activities, not the linguistic characteristics of the corpora as texts per se.

2. The corpora. The 'theoretical' and 'applied' linguistics corpora are drawn from the journals *Language* (L) and TESOL *Quarterly* (TQ), respectively. The corpora do not include tables of contents, editorials, short notes, reviews, ads, or the abstracts or references sections of the articles themselves, only the main section articles. *All* main section articles from the volumes identified are included from each. As table 1 shows, the total corpus comprises 38 articles with somewhat fewer than 400,000

Journal	Volume	No. of Articles	Word Count
L	67 (1991)	14	217,447
TQ	25 (1991)	24	159,662
		Total	377,109

Table 1. The Corpora.

words of text altogether. The corpora have been selected not for 'genre characteristics' or supposed representativeness as 'applied' vs. 'theoretical' linguistics articles, but because they are drawn from journals produced by organizations whose function and membership can be clearly identified (on non-linguistic grounds) as belonging to one or the other of those two categories (Coleman 1997a).

3. HOW THE WRITERS CHARACTERIZE THEMSELVES AND WHAT THEY DO. The corpora were analyzed for occurrences of tokens of the following types: EXAMINATION, EXPLORATION, INQUIRY, INVESTIGATION, PAPER, PROBE, RESEARCH, SCRUTINY, STUDY, and WORK. (Here and below, types are identified in SMALL CAPS and tokens in *lowercase italics*.) Each type included all related derivational forms, e.g., for EXAMINATION, the tokens *examination*, *examinations*, *examine*, *examined*, and *examining*. However, only tokens referring to scholarly activities of the author or of colleagues (or the product of same) were counted; i.e., those counted included tokens such as (1)–(4).

(1) ...we have found instances, some *examined* earlier in this paper... (TQ 25-1;9.24)
(2) Let us *examine* the first question. (TQ 25-2;231.241)
(3) An *examination* of our corpus of naturally-occurring data reveals... (L 67-3;439.453)
(4) Following and re*examining* Safir's 1986 proposal... (L 67-4;726.739)

(Sources are indicated after cited tokens in the following format: journal volume - number ; starting page of the article . actual page on which the token occurred.) Not counted were tokens like those in (5)–(9), which refer, for example, to activities in instructional settings being written about or which occur in examples cited by a writer as his/her 'data'.

(5) Traditionally the second language methods course has *examined* the historical and... (TQ 25-1;29.29)
(6) These are rich sources for teachers to *examine* when... (TQ 25-1;51.54)
(7) Suppose that we want to develop a writing test as a final examination for... (TQ 25-4;671.695)

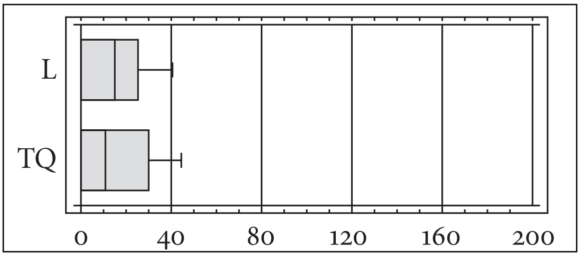

Figure 1. Box-and-Whisker Plot of median rates for WORK in L and TQ.

(8) …analogous to that of the blind men *examining* the elephant… (L 67-3;547.561)

(9) Lee persuaded Tracy to *examine* Kim. (L 67-1;63.71)

Counts of the tokens of all of the types listed above were restricted in this way. Thus, any token of PROBE referring, for example, to a medical instrument, a spacecraft, or the name of a make of automobile was excluded, as were any tokens of PROBE referring to classroom activities ESL students might engage in.

For each article, the number of tokens (n_t) of each type was identified. Then the rate of occurrence was calculated for each (n_t ÷ total word count for that article). No significant differences (assuming the conventional significance level of $p \leq 0.05$) in rate of such usage were found between the L and TQ corpora for any of the following: INQUIRY, INVESTIGATION, PAPER, PROBE, SCRUTINY, and WORK. Because a Kolmogorov-Smirnov (K-S) test revealed that the data for each of these items was not normally distributed, a Wilcoxon W (also called 'Mann-Whitney U') test was applied to each. Wilcoxon W compares two group medians, so it was basically showing that median rate of tokens of each usage did not differ across L and TQ for any of them.

A box-and-whisker plot is a graphic way of displaying a comparison of medians. Figure 1 shows a box-and-whisker plot for the median rates of WORK in L and TQ. The 'box' (shaded grey) components of the figure show a 95% confidence interval for each median. For example, that for the median rate of WORK (per 100,000 words) in TQ—shown by the the bottom box —is roughly from 0 to 30. The vertical line in the center of the box represents the median. That for TQ is thus slightly greater than 10. The 'whisker' projecting off to the right shows the range of values for each distribution; that for TQ goes upward to a bit less than 50. The high degree of horizontal overlap between the boxes representing the confidence intervals for the L and TQ medians shows graphically that they are not significantly different.

Wilcoxon W was also applied to rates of tokens of each of the remaining types in this category: EXAMINATION, EXPLORATION, RESEARCH and STUDY. All were significantly different, with articles from L showing lower median rates of occurrence

	L Median Rate	TQ Median Rate	Wilcoxon W	Significance (p)
EXAMINATION	7.78181	60.2016	259.5	0.00272649
EXPLORATION	0.00000	17.0838	243.0	0.00671074
STUDY	16.4711	82.0062	245.5	0.00935016
RESEARCH	10.0766	212.45	324.0	0.00000126042

Table 2. Rates of Tokens of EXAMINATION, EXPLORATION, RESEARCH and STUDY.

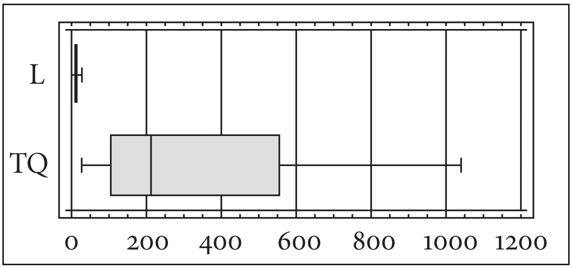

Figure 2. Box-and-Whisker Plot of median rates for RESEARCH in L and TQ.

in every case. See Table 2 (all tests are directional, H_A being $\text{Median}_L < \text{Median}_{TQ}$). All rates are reported as frequency per 100,000 words of text.

The box-and-whisker plot for RESEARCH (Figure 2) shows a very different picture than that for WORK, above. Here, the confidence interval for the L median is very small, barely away from 0, and the box for the confidence interval is squashed flat almost into a neat vertical line. This is because the entire range of individual rates for separate articles in L is very small. The confidence interval for the TQ median, on the other hand, is fairly wide, from about 100 to 550. Still, there is clear horizontal separation between the two confidence intervals. This plot shows graphically what the Wilcoxon W test reveals quantitatively.

Discriminant analysis was then applied to see how well the rates of occurrence of these tokens could predict which journal an article had come from. Table 3 shows the resulting classification table. The derived discriminant function was significant at $p \leq 0.05$. Note that all articles from L are correctly classified on this basis. Six (25%) of the articles from TQ are incorrectly categorized. This is because the degree of variation in the L articles in extremely low, all articles showing very low rates for each of the tokens listed. The degree of variation in the TQ articles is higher, with *some* articles exhibiting low rates of occurrence, but with most having much higher rates.

Figure 3 shows graphically how the data points group based on three of these four types (STUDY, EXAMINATION, and EXPLORATION). L data is represented by the small squares, TQ data by the X's. Note how all of the small boxes representing L data clusters together in the lower left-hand corner, but how the TQ data points are

Actual Journal	Group Size	Predicted Journal	
		L	TQ
L	14	14 (100.00%)	0 (0.00%)
TQ	24	6 (25.00%)	18 (75.00%)

Table 3. Classification Table of Predicted Journal Based on Rates of Tokens of EXAMINATION, EXPLORATION, RESEARCH and STUDY.

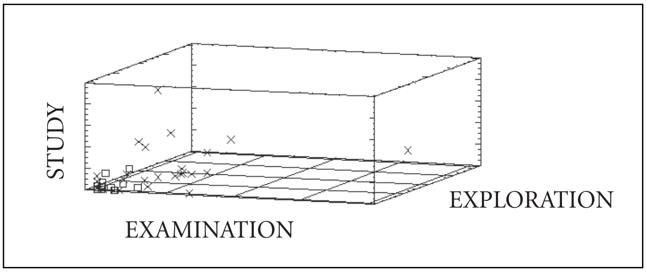

Figure 3. Three-dimensional Plot of L and TQ by rates of STUDY, EXAMINATION, and EXPLORATION.

spread out over a much larger region, i.e., there is a high degree of homogeneity in usage of these three types in L, much less so in TQ. When one considers the relative homogeneity of educational backgrounds of L writers (at least compared to TQ writers, who may graduate from programs in linguistics, TESOL, education, rhetoric and composition, as well as a number of other fields) and the relative homogeneity of shared outlook toward their work that results, this is not surprising.

EXAMINATION, EXPLORATION, and STUDY are fairly neutral terms and could apply in scientific or philosophical domains. While it can be granted that the difference in their rates between L and TQ may be simply stylistic, RESEARCH is generally associated with science rather than philosophy. Thus, it is particularly interesting to note the significantly greater rate of occurrence for RESEARCH in TQ as a self-characterization of the activity of the field. The sub-type RESEARCHER also exhibited a significantly greater frequency of occurrence in TQ than in L (W=272.0, p=0.000566007) to refer to those working in the field. This means—given that there is no 'neutral' type used more frequently in the L corpus—that a greater proportion of the time, 'applied' linguists refer to themselves as *researchers* than do 'theoretical' linguists. Thus, there appears to be a measurable tendency for those working in 'applied' linguistics to think of themselves as *researchers* doing *research* more often than there is for those in 'theoretical' linguistics.

Another way the writers characterize who they are and what they do is in their choice of ways to refer to the ideas about the things they are investigating. Do they call these ideas *questions*, *problems*, *hypotheses*, or *theories*, for example? A Wilcoxon

W comparison of rates of occurrence of the types HYPOTHESIS and THEORY revealed no difference between L and TQ (at $p < 0.05$). However, when the usages of these types were examined not only quantitatively but also qualitatively, significant differences came to light.

Part of the definition of a thing is revealed by what it is put in contrast with. For example, one frequent set of collocations of THEORY involved the type PRACTICE (*practice*, *practices*, *practical,* etc.). This contrast showed up explicitly much more often in TQ than in L ($\text{Median}_L=0.0$, $\text{Median}_{TQ}=19.9308$, $W=261.0$, $p=0.000755904$). A contrast between THEORY and RESEARCH likewise showed up more frequently in TQ than in L ($W=261.0$, $p=0.000755904$, assuming a directional test, i.e., H_A: $\text{Median}_L < \text{Median}_{TQ}$). Writers in TQ are more likely to distinguish *theory* from *research* than are those in L (i.e., they see theory-building as something apart from doing research) and are more likely to contrast the activity of theory-building with the practical issue of whether theories 'work' in the 'real world'. Examples of THEORY contrasted with PRACTICE are shown in (10)–(12), examples of THEORY contrasted with RESEARCH, in (12)–(13).

(10) ...collaboration between *theorists* and *practitioners*... (TQ 25-2;231.240)
(11) ...with both *practical* and *theoretical* perspectives... (TQ 25-3;481.487)
(12) ...*theory*, *research*, and teaching *practice*... (TQ 25-2;261.263)
(13) ...mentioned in discussions of *theory* and *research*... (TQ 25-3;407.417)

In addition, occurrences of THEORY were tabulated separately depending on what kinds of things they were identified as 'theories of'. Tokens in the form *theory of/about/on/in X*, *X theory*, and *X theoretically* were included. Not all occurrences were explicit in this regard. Such explicit THEORY-OF tokens were categorized into three subtypes as either referring to language or elements of language (see (14)–(17)); referring to people, their characteristics, or activities ((18)–(20)); or as referring to 'schools of thought' ((21)–(23)).

(14) The tree-based *theory* of meter claims that... (L 67-2;240.241)
(15) According to the combinatory *theory* of grammar... (L 67-2;260.291)
(16) The *theory* of language that underlies this... (TQ 25-1;51.67)
(17) For monostratal syntactic *theories* which reject... (L 67-3;547.580)
(18) A primary goal for ESL reading *theory*... (TQ 25-3;375.378)
(19) ...any comprehensive *theory* of listening behavior... (TQ 25-3;341.432)
(20) ...in the context of pedagogical *theory*... (TQ 25-3;431.435)
(21) The impact of Chomsky's *theory*... (TQ25-2;315.324)
(22) Appealing to Government-Binding *theory*... (L 67-3;439.448)
(23) We know of no major CLT *theorist* who maintains... (TQ25-1;9.24)

	Language	**People**	**'School'**	**Row Total**
L	141	2	31	174
TQ	16	74	8	98
Column Total	157	76	39	272

Table 4. Crosstabulation of L vs. TQ by subtypes of THEORY-OF.

A Chi-square (χ^2) analysis was then performed to determine whether there was any correlation between usage of these subtypes of THEORY-OF and their occurrence in L vs. TQ. The result was significant (χ^2=173.616, d.f.=2, p=0.00). Given the observable differences in rates of each subcategory, we can conclude that theories in L are more likely to be theories of language or hypothesized elements/components of language; theories in TQ are more likely to be theories of people and their activities. The distribution of recognizable tokens in these subtypes is shown in Table 4.

These results are in accord with previous results (Coleman 1997b) concerning a subset of the current corpus (about half of it). Different subtypes of the type DATA were compared, showing that DATA tokens in L and TQ referred to different sorts of things. L tokens of DATA tended to refer to individual (unsourced) example sentences, while that in TQ tended to refer to tables of (sourced) figures and, less often, to (sourced) transcripts and the like. Also, earlier results found that DATA and EXAMPLE often referred to the same kinds of things in L (individual unsourced example sentences), but never did in TQ.

4. How FREQUENTLY WRITERS MAKE THEIR ASSUMPTIONS EXPLICIT. In sciences, there is a relatively broad consensus about what things can be assumed and what cannot. In philosophy, in contrast, it is up to the individual philosopher to make his or her personal assumptions known to readers. Indeed, philosophical systems can be set up with different assumptions at different times and under different conditions, based on what is convenient for the task at hand. We might therefore expect to find that assumptions (not only the author's own) would be made explicit at a greater rate in 'theoretical' linguistics than in 'applied' linguistics, if indeed, 'theoretical' linguistics is more closely affiliated with philosophy and 'applied' linguistics, with the social sciences. Tokens of the following types referring to assumptions were tabulated in both corpora: ASSUMPTION, GIVEN, HYPOTHETICAL, PRESUMPTION, PRESUPPOSITION, and POSIT when they referred to things supposed, posited, or otherwise taken in advance.

The type ASSUMPTION included tokens such as those in (24) and (25). It did not include any tokens which had the sense 'take on', 'take over'.

(24) We *assume* that it is difficult for one to… (TQ 25-1;9.18)
(25) …addressed the following central *assumptions* of CLT… (TQ 25-1;9.23)

The type GIVEN included only tokens which identified things given in advance as factual, e.g., those in (26)–(27). It did not include other uses of *given* such as those in (28)–(30), where the sense is that of 'transferred', 'provided', or 'particular'. Tokens of *given* as a 'technical term' of linguistics (i.e., *given* vs. *new*) were also not included.

(26) *Given* the relatively large standard deviations… (TQ 25-1;77.96)
(27) …*given* that most attention was focused on… (TQ 25-2;315.321)
(28) …the materials developed and instruction *given* during…
(TQ 25-1;77.77)
(29) Forms of the morpheme, *given* in Table 2… (L 67-1;1.14)
(30) …greatest learning challenge at any *given* moment…
(TQ 25-3;459.467)

Only 8 tokens of HYPOTHETICAL were found in the whole of both corpora combined, four of them occurring in one article (L 67-3;547). A typical token is shown in (31).

(31) …a *hypothetical* basic (i.e., nonpassive) verb meaning…
(L67-3;547.576)

The type PRESUMPTION was taken to include tokens such as *presumption*, *presumptions*, *presume*, *presumed*, *presuming*, or *presumably*. Example tokens are shown in (32)–(34).

(32) …been *presumed* that there is such a thing as language aptitude…
(TQ 25-2;315.329)
(33) …*presumably* due to an underlying restructuring… (TQ 25-2;315.336)
(34) The *presumption* here is that… (L 67-4-675.707)

PRESUPPOSITION was taken to include tokens such as *(pre)suppose*, *(pre)supposes*, *(pre)supposed*, *(pre)supposing*, *(pre)supposition*, *(pre)suppositions*. References to the 'linguistic phenomenon' of presupposition were excluded. A few illustrative examples are given in (35)–(38).

(35) Thai teens *supposedly* see the teen years… (TQ 25-1;123.127)
(36) *Suppose* for a moment… (TQ 25-4;471.693)
(37) …universals have to some degree *presupposed*… (L 67-1;1.2)
(38) …*presupposes* that the property ADJ… (L 67-3;547.609)

The type POSIT occurred at a relatively low rate in both corpora. A typical example is shown in (39).

(39) …in Generative Semantics it was *posited*… (L 67-3;439.441)

Comparing the two corpora, there was no significant difference (determined using Wilcoxon W in each case) in the rate of occurrence of GIVEN, HYPOTHETICAL, PRESUMPTION, PRESUPPOSITION, or POSIT at the level of $p \leq 0.05$. The result for HYPOTHETICAL, however, was suggestive, with W=139.5 and p=0.11174. In contrast, the result for ASSUMPTION was more than suggestive. The rate of ASSUMPTION tokens was significantly higher in L than in TQ, as shown via a t-test (in this case, the data was normally distributed and the t-test was preferred), with t=2.05668 and p=0.0297047. This is in accord with earlier results, which compared tokens of *in-FACT* and *the-FACT-that* (Coleman 1997b) across L and TQ. They showed that writers of TQ articles used significantly more tokens of *in-FACT* to make assertions (t=-2.80, $p < 0.01$) than did writers of L articles. Furthermore, writers of L articles used significantly more tokens of *the-FACT-that* to express presuppositions than did writers of TQ articles (t=2.48, $p < 0.022$).

Presuppositions need to be made explicit when writers have reason to believe that they do not share the same presuppositions as their readers. Clearly, results here indicate that writers of L articles feel a greater need to make presuppositions explicit than do writers of TQ articles. At first glance, this may appear odd, indeed. After all, it would seem that L writers share more of a common outlook than do TQ writers.

5. CONCLUSIONS. Here is a summary of the major results obtained here and in Coleman (1997b) and some generalizations which can be drawn from them.

Writers in TQ are much more likely to characterize what they do as 'research' and themselves as 'researchers' than are writers in L. This difference in self-characterization is consistent with an identification of 'applied' linguistics with science and 'theoretical' linguistics with philosophy.

Writers in TQ are much more likely to refer to something as 'data' if its source is explicitly identified and if it refers to (describes or quantifies) characteristics or behaviors of people. Writers in L are much more likely to refer to something as 'data' if it is unsourced and if it consists of example sentences, cited forms, or even their own analyses of the same. The data of science consists of observations of events in the 'real world', so there is a clear demarcation in science between data and the researcher's thoughts about the data. This demarcation is present in the usage of writers in TQ, but not in that of writers in L.

Writers in L tend to use 'example' and 'data' interchangeably. Writers in TQ do not. Note that in science, examples exemplify, but are 'mere anecdotal data'.

Writers in L make more of their assumptions explicit than do TQ writers. This is a hallmark of a discourse community in which basic assumptions are not shared by most members of the community. It is not a hallmark of science, but of philosophy, in which one accepts different basic assumptions at different times, based on what will be most convenient to the purpose at hand.

Finally, writers in L are much more likely to explicitly identify their 'theories' as being either (1) theories of language or of purported elements of language or (2) 'school-of-thought' theories. Writers in TQ are much more likely to explicitly identify their 'theories' as being theories of people, their characteristics, or their behaviors. Even as linguists we need to remind ourselves that language is not something we can directly observe in the 'real world'. We can directly observe people engaging in communicative acts. However, when we use the term 'language' to refer to phonology, morphology, syntax, semantics, etc., we are referring to a system we have constructed as our *explanation* of those acts. We are not referring to the acts themselves. Thus, theories about language are, strictly speaking, not theories of observable events; they are theories about a theoretical construct which has been taken in advance to exist. In science, theories are theories of observable events, not theories of presupposed abstractions.

All of the above point toward writers in TQ writing more within a framework of social science, but those in L, within a framework of philosophy. Neither approach can be judged 'superior', because each has a different purpose. However, if linguists in both subfields continue to ignore the fundamental differences in their approaches, they will continue to suffer the consequences of what Yngve (1996:24) has called 'domain confusions' of elements of science and philosophy.

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THE INFLUENCE OF FRENCH ON QUEBEC ENGLISH: MOTIVATION FOR LEXICAL BORROWING AND INTEGRATION OF LOANWORDS

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Quebec has been one of the most active centres for the investigation of language contact, language attitudes and language planning in recent years (Bourhis 1982:35). The overwhelming majority of this work has concentrated on Quebec French, and studies of linguistic borrowing have focused on borrowing from English into French.

The purpose of this paper is to study lexical borrowings from French in Quebec English, as evidenced in a written corpus.[1] The influence of French on English in Quebec has been less dramatic than the converse, and interest in this phenomenon has been correspondingly much more modest. Nevertheless, the variety of English used in Quebec is increasingly distinctive from varieties used elsewhere in Canada and North America, it being distinguished largely, but not exclusively, by the strong influence of French on the lexicon.

1. Background. On the federal level, Canada is officially bilingual, the Official Languages Act of 1969 having established English and French as the two official languages of Parliament and federal government services. However, French has been and remains the language of the minority of Canadians, other than in Quebec, the one predominantly French province, where French is the first language of more than 80% of the population.

With French being a minority language not only within Canada but also within the whole North American context, the French language has for centuries been on the defensive against assimilation by English. In the last thirty-odd years, the linguistic balance of power has changed radically within the province of Quebec. The Quiet Revolution, the modernization of Quebec society in the 1960s, led to the rise of the Québécois nationalist movement based largely on the protection and promotion of French within Quebec as a means of ensuring the survival of this French-speaking community within North America. The early 1960s saw the beginning of language planning in Quebec, with the creation of the *Office de la langue française*. In 1974, the *Loi sur la langue officielle* made French the only official language of Quebec. The dominant position of French was firmly established by Bill 101, the *Charte de la langue française*, in 1977. Since then, Quebec has seen concentrated efforts and aggressive language policies to ensure the use of French in Quebec in all walks of life. These policies have resulted in increased vitality and use of French as compared with English, and in greater recognition of Quebec French as a legitimate and standard variety of French (Bourhis 1982:59).

Although English may to a degree be protected from regionalism by its predominance in mass media, daily life in any of the English communities in Quebec reveals the use of a fairly unique lexicon marked by the influence of French. Interest in this lexicon has been manifested particularly in the past two decades, as its distinctiveness has become more apparent. This growing distinctiveness can be attributed to at least three factors. First, a growing number of Quebec anglophones are bilingual, with French being the language of the provincial government and the workplace, with the English-language school system promoting bilingualism at all age levels, and with the exodus of many of the anglophones who were unwilling to adapt to life in an officially French-speaking society. Second, Quebec government language policy has entrenched the use of French designations for many provincial, geographic, social, and political realities, and these designations are used in both languages. Third, with English assuming the role of a minority language within an independence-minded Quebec and with the English-speaking community of Quebec shrinking, the decreased prestige and vitality of English within Quebec has left it more susceptible to borrowings from French.

Scholarly interest in Quebec English has grown in the past two decades. Articles on the topic include papers by Roberts (1982), Manning and Eatock (1982), Plaice (1984), Palmer and Harris (1990), Fee (1991, 1995) and Russell (1996), as well as a monograph (McArthur 1989). Recently published reference works on the English language have acknowledged the uniqueness of Quebec English (McArthur 1992; Fee & McAlpine 1997). Less scholarly commentary on the phenomenon can be found in countless articles and editorials in the English Quebec press, as well as in publications such as *Bonjour Quebec eh?* (Keith-Ryan & McCully 1996) and the *Angloman* comic books (Shainblum & Morrissette 1995, 1996).

2. THEORETICAL PREMISES. This paper investigates lexical borrowings from French in a written corpus of Quebec English, describing features of borrowing and integration that are specific to the language communities under study as well as some that are of interest to studies of language contact in general. The following research questions are addressed: To what extent are borrowings integrated in the corpus, and how is the flagging of borrowings related to integration? What are the most common semantic fields of borrowings in the corpus? What parameters can be postulated to account for motivation for borrowings in these texts? How do borrowings reflect the social and rhetorical contexts in which they occur?

The theoretical foundations of this study are based on the terminology and conceptual frameworks developed by previous researchers. Weinreich (1953) and Haugen (1950) wrote seminal works on language contact and borrowing, in which they established and defined much of the terminology used in the field today. The present analysis and discussion are restricted primarily to full lexical borrowings, which are defined by Poplack, Sankoff and Miller as 'the incorporation of individual L2 words (or compounds functioning as words) into discourse of L1, the host or recipient language, usually phonologically and morphologically adapted to conform with the patterns of that language, and occupying a sentence slot dictated by its syntax' (1988:52).

The distinction between singly occurring borrowings, or nonce borrowings (Weinreich 1953), and established borrowings is an important one: nonce borrowings tend to be unpredictable and are part of the speech or writing of bilinguals, whereas high frequency forms can be considered part of the mental lexicon of Quebec English. Indeed, the status of nonce borrowings is central to the debate on the distinction between borrowing and code-switching, and has been the subject of some of the most interesting recent work in language contact (Myers-Scotton 1997; Poplack, Wheeler & Westwood 1990). Myers-Scotton considers that singly-occurring forms, whether code-switches or borrowings, are 'part of the same developmental continuum' (1997:163) and maintains that 'it is unproductive to try to distinguish between them *from the standpoint of the morphosyntactic processes which they undergo*' (1997:5, emphasis in the original). Both established and nonce borrowings are included in this analysis, and the distinctive characteristics of their use in the corpus are described.

Most studies of borrowing and codeswitching have focused on spoken discourse, as have most sociolinguistic studies of all variation. Indeed, the dialectologists' preferred collection method is the recording of spontaneous speech, and the ideal corpus for studying variation has traditionally been the spoken vernacular, in which the minimum attention is paid to monitoring (Labov 1972:308). Thus the use of a written corpus for language contact research has several important implications. First, we can expect to find a lower frequency of borrowing in this corpus than researchers would find in informal spoken discourse. Second, the established borrowings used in the edited, published texts of our corpus can be assumed to have acquired a certain degree of acceptability, standardization, and authority: 'Variants which are used in written communication are much more likely to be standardized than those which are used solely in the oral modality' (Bouchard-Ryan, Giles & Sebastien 1982:3). Third, since written discourse is often prepared with rhetorical forethought, some of the occurrences of borrowings may reflect rhetorical intent. Fourth, the language behavior exhibited in our corpus is distinct from natural speech not only in style and mode but in the fact that it is mediated discourse from the public domain where interaction with the audience is attenuated, non-reciprocal, and non-spontaneous.

Thus, although some of this analysis is based on established notions from the field of language contact research, the phonological aspect of borrowing, so central to much research, is absent. Instead, the use of a written corpus invites the incorporation of notions traditionally associated with the study of written discourse as a rhetorical event. Texts are analyzed using parameters such as purpose, topic, and genre, defined by Swales as a collection of goal-driven communicative events that share a set of communicative purposes and as such act as a determinant of linguistic choices (1990:41, 42). Borrowings, like shifts of style or register, are indices that can mark the discursive fabric of the text and express rhetorical intention, projecting the identity and attitudes of the writers and their alignment with the audience or with the linguistic communities in contact.

3. METHODOLOGY. This article is an interim report on findings from the first two years of a three year research project launched at the Université de Sherbrooke in 1996, first described in Russell (1996). The findings presented here are based on a partial analysis of an expanding corpus in an ongoing research project, and our analysis and conclusions are obviously not definitive.

The corpus consists of three components: a journalistic corpus, a touristic corpus, and an administrative corpus. The journalistic corpus is by far the most extensive, and is composed of both electronic and paper documents. The electronic corpus analyzed to date contains the 1994 and 1995 issues of *The Gazette*, the principal English-language daily of Quebec, containing 120,447 newspaper articles. We have been searching this section of the corpus electronically to ascertain frequencies of use of loanwords, to find examples of uses, and to compile quantitative data. This electronic corpus is supplemented by paper copies of a dozen weekly and monthly English-language newspapers from various areas throughout Quebec. The touristic corpus consists of over two hundred tourist guides, brochures, and pamphlets put out by government, municipalities, and tourist bureaus and agencies. The administrative corpus consists of some fifty documents, including annual reports and other publications of English-language hospitals, English language school boards, and English-language associations from throughout the province.

We have limited our analysis to recent borrowings, eliminating well-established borrowings that have been widely assimilated into English outside Quebec (although we have retained some borrowings, such as *allophone*, that have made their way into Canadian political discourse but are still strongly associated with Quebec). We have compiled an open-ended list of several hundred words and expressions that appear to reflect usage primarily distinctive to Quebec, verifying this impression by checking for the words in a number of English dictionaries (the *Gage Canadian Dictionary*, the *Random House Webster's*, and the *Oxford English Dictionary*) and by searching a corpus of English-language newspapers from outside Quebec. We have established a master list of some four hundred distinctive words and expressions found in our corpus to date, including nonce borrowings, established borrowings, and semantic extensions.

4. OBSERVATIONS. This paper focuses primarily on full lexical borrowings, including single words such as *dépanneur* (convenience store), acronyms and initialisms such as *cegep* (a type of junior college) and *CLSC* (a local community service centre), and collocations such as *vieille souche* and *pure laine* (terms used to designate French Quebecers of old stock). Proper names of institutions are discussed where relevant but have not been included in our lists of borrowings.

In keeping with the hierarchy of borrowability suggested by Weinreich (1953) and Haugen (1950) and with the general consensus among researchers that common nouns are by far the class of elements most easily borrowed, the overwhelming majority of single lexical items identified are nouns, with a small incidence of verbs (*francize*) and adjectives (*kétaine*). Some words such as *allophone* can function either as nouns or as adjectives and cannot be classified categorically as one or the other.

All sections of the corpus contain an abundance of French proper names, used to designate government departments and agencies, businesses, organizations, positions, and events. Many of these display standard French head-first word order (*Fête nationale*, *Hôtel Maritime*, *Club Price*). Also frequently observed is the use of acronyms (*cegep*, *ZEC*, *DEC*) and initialisms (*CLSC*, *SQ*, *PQ*, *BQ*, *OLF*) derived from French-language designations. The regular use of terms such as *régie*, *caisse*, and *fonds* in proper names has led to these terms being used generically as common nouns.

(1) …they would pay for repairs only if the municipalities created a *régie* to manage the lake.

Because of the great difference in size of the sections of the corpus, we established separate frequency lists for each section. The semantic fields of borrowings are highly dependent on the section of corpus and the subject matter of the texts in which they occur.

In the journalistic corpus, we noted 45 high-frequency borrowed forms, defined, admittedly arbitrarily, as those forms occurring more than 10 times in this section of the corpus. Over one third (35%) of such words were from the fields of language and politics and designated language and ethnic group membership or political strategies (*allophone*, *francize*, *virage*, *nous*, *anglais*, and *pure laine*). Another 16% related to government, education, health, and social institutions and services (*cegep*, *régie*). These two semantic fields accounted for more than half of the established borrowings. Words from the fields of entertainment and tourism (*vernissage*, *auberge*) accounted for 20%; food (*poutine*), for 9%; transportation and daily life (*metro*, *autoroute*, *dépanneur*), 11%; and 9% miscellaneous. The heavy concentration of terms related to language and politics is not surprising in view of the subject matter of a journalistic corpus, containing many editorials and articles of opinion.

In the touristic section of the corpus, almost 90% of high-frequency borrowed forms (defined in this much smaller corpus as those forms occurring more than 4 times) were concentrated in fields directly related to tourism: food, accommodation and dining (*gîte*, *auberge*, *terrasse*), history (*intendants*, *seigneur*), entertainment (*planche à voile*, *boîte à chansons*), and terms relating to natural features, fauna, flora, and particularly camping, fishing (*ouinaniche*e), and hunting (*appelant*, *pourvoirie*). Stereotypical fixed expressions such as *joie-de-vivre* and *la belle province* were used in numerous documents. Nonce borrowings were used to designate distinctive local features and attractions and were often flagged and accompanied by translations, explanations or descriptions.

(2) An *aboiteau* is an earthwork dike protecting the agricultural land from saltwater infiltration.

In the administrative section of the corpus, almost all borrowings were references to Quebec government departments, agencies, programs and services (*francization*, *classes d'accueil*, *plan d'action*) or references to the educational and health care systems (*cegep*, CLSC, *régie*).

Thus what emerges is a profile of the domain of discourse as well as of the field of borrowing. Some established borrowings were found in all sections of the corpus (*cegep*, *régie*, *autoroute*, *metro*); others were domain-specific, with high frequency use in specific contexts. For example, several of the most common journalistic borrowings from the field of language and politics (*pure laine*, *vieille souche*) were entirely absent from the administrative and touristic sections of the corpus.

5. INTEGRATION. A lexical item goes through a transitory process in which it gradually loses its status as a foreign term and becomes integrated into the lexicon of the host language. This evolution of a borrowing from a non-integrated nonce to an established loanword presumably parallels the spread of a term from its introduction by bilinguals within the language community through to its adoption by the community, including monolinguals. Stages in this process were reflected in the following ways.

5.1 ORTHOGRAPHY. In the absence of phonological representation, the foreign status of a term may be indicated by orthographic features such as the retention of the spelling (*francisation* versus *francization*), accents (*dépanneur*, *Québec*), or hyphenation (*St-Laurent Boulevard*) used in the donor language. In many cases, whether or not such features are retained appears to be arbitrary (for example, *dépanneur* was spelled both with and without the accent in the same publication) or dictated by style guides such as the *Canadian Press stylebook* or *The Canadian style*. But in other cases, the retention of indications of foreign status appears to have a rhetorical purpose: for example, within the touristic section of the corpus, *Montréal* retained its accent in 62% of its uses, and *Québec* (city), in 90%; here the retention of the accent appears to be a rhetorical choice, designed to accentuate the exotic flavour of the destination for the would-be tourist.

5.2 TYPOGRAPHIC FLAGGING AND METALINGUISTIC COMMENTARY. In studies of spoken discourse (Poplack 1993; Poplack, Wheeler & Westwood 1990), code-switches have been described as either *smooth* or *flagged*. This distinction has proved useful when applied to written borrowings, where flagging includes typographic markings such as italics, boldface, or quotation marks which set a word or term apart. Typographic flagging can be purely arbitrary; in some publications, French institutional terms appear, apparently indiscriminately, in italics and roman type. Typographic flagging can be useful in distinguishing a borrowing from a word in the host language: for example, *stage*, a work term or internship, is flagged by italics or quotation marks in English texts to reflect the French pronunciation of the term and to distinguish it from its English homograph.

The use of quotation marks as a flagging device was particularly interesting in our corpus. Palmer and Harris comment on the use of quotation marks with borrowed terms, noting that absence of such flagging 'indicates either a high degree of acceptance of these terms or that the writers of these documents are unconscious of these as French terms' (1990:83). Certain established Quebec English terms (*vedette*, *poutine*) were found to be unflagged in *The Gazette* but flagged in their rare occurrences in Canadian newspapers from outside Quebec, indicating an inverse relationship between flagging and frequency.

But typographic features such as italics and quotation marks can be used in different ways for different purposes. *The Chicago Manual of Style* describes the use of italics and quotation marks to achieve special effects: these include the use of italics for 'isolated words and phrases in a foreign language if they are likely to be unfamiliar to the reader' (169) as well as for 'key terms in a discussion, terms with special meaning, and, in general, terms to which the reader's attention is directed' (171). As well, quotation marks are used for irony and for slang, to indicate that the word is 'foreign to the normal vocabulary of the speaker' (173).

Thus we found that quotation marks were used to flag terms in two very different ways. First, they served to highlight nonintegrated borrowings, particularly nonce borrowings, that the monolingual reader might not understand, the borrowed item often being accompanied by a translation or an explanation. Second, quotation marks were used with established but highly charged terms of political discourse, almost exclusively in journalistic articles and editorials on language and political issues. For example, there was a high frequency of use of quotation marks with the expressions *les autres*, *les anglais*, *maudits anglais*, *pure laine*, and *francization*. Here the quotation marks often signal ironic use, indicating the writer is deriding a term or distancing himself or herself from it by associating the word with the discourse of the other language community.

(3) …the students won't be in an entirely French environment and will therefore not be 'francized'…

Borrowings flagged in this way are like any intralingual register shift or style shift—they are a form of variation as rhetorical strategy. This use of flagging was used virtually exclusively in journalistic texts, primarily in editorials. Unflagged ironic use of borrowings was also observed, the simple switch to a borrowed term in itself reflecting irony.

Borrowings are also set apart by metalinguistic commentary and the presence of material which translates or explains a term. In such cases, the explanatory material is inserted between dashes (4), between parentheses (5), in apposition (6), introduced by the conjunction *or* (7), or included as a redundancy (8).

(4) if he is 'ministrable'—*cabinet material*—
(5) If you think country music is kétaine (*kitsch*), then most of North American culture is kétaine.
(6) Next week begins *what the French call* 'la rentrée', *the return to work, school—and reality.*
(7) Bloc leader Bouchard called, in April, for a 'virage' or *sharp turn in sovereignist strategy*.
(8) The Caisse Populaire *credit union* has branches throughout the province.

Some forms of metalinguistic commentary can be neutral, as in the above examples; in other cases it can either stigmatize a term (9), (10), or show solidarity (11).

(9) …the allophones, *that dreadful word for Montreal's immigrant community*…
(10) …*so-called* de souche francophones...
(11) Or was the crisis merely a heaven-sent opportunity to cynically slip us a fast one—'un gros sapin' *as we say in these parts*…?

Negative metalinguistic commentary was found primarily in journalistic articles and editorials on language and political issues: words so marked were allophone, anglophone, les autres, francization, pure laine, and souche.

5.3 MORPHOSYNTACTIC INTEGRATION OF BORROWINGS. Once borrowed, loanwords may reflect the lexical dynamics of the host language in a number of ways; for example, in our corpus we observed the presence of a number of clipped forms (*dep* [from dépanneur], *allo* [from allophone], *caisse pop* [from caisse populaire], *radcan* [from Radio-Canada]). Borrowed terms also form compounds (*vedette-watching*, *calèche driver*, *cegep student*) in typically English patterns.

The degree of morphosyntactic integration is not always uniform, as illustrated in the following examples:

(12) The money will be used to reinforce the capital base for the credit union branches, known as *caisses populaires*.
(13) All *Caisse Populaires* will take orders for the book…
(14) *Caisse pops* to share manager (Headline from *Stanstead Journal*)

All three sentences show the use of the borrowing of a French noun-adjective mix, the term *caisse populaire*. In (12), the expression has been borrowed as a unit, the grammar of the borrowing reflecting French morphosyntax, with the head and its modifier both inflected for the plural. In (13) and (14), there has been a reassignment of category: the adjective *populaire* (13) and its clipped form *pop* (14) have become the head of the noun phrase and are inflected for number, while the noun *caisse*, assigned the role of modifier to match the head-last order of English noun-adjective mixes, is not inflected for number, in accordance with English grammar.

(15) *cuisine québécoise* (tourist brochure)
(16) *Québécoise cuisine* (tourist brochure)
(17) *québécois cuisine* (tourist brochure)

In (15), the expression has been borrowed as a unit, with the French modifier *québécoise* following its head according to the standard head-first order of French syntax. In (16), the noun and modifying adjective follow the English head-last word order for such a noun phrase, but the head is still presumably marked for gender and the modifier *Québécoise* retains the gender inflection. In (17), the modifier is morphosyntactically integrated into English, with gender unmarked.

5.4 INNOVATIVE USE OF BORROWINGS. In discourse, borrowings can deliberately be used in innovative ways to achieve a desired effect. In headlines, a distinctive genre whose purpose is to attract attention and arouse interest, borrowings can be used playfully to attract attention and to invite the reader to share in a humorous play on words:

(18) To artists, *Oui* are the world
(*Gazette*, 5. November 1995, from an article discussing the artistic community's support for the yes side in the 1995 referendum)

(19) All we are saying is give *piste* a chance
(*Stanstead Journal*, 10. June 1998, from an article advocating the creation of a bicycle trail or piste)

(20) *Juste pour queer*
(*Mirror*, 27. July 1996, from an article about gay humour, a reference to the comedy festival Just for Laughs/Juste pour rire)

(21) The entreaide: A weekend of hard decisions
IT'S A CAISSE OF MISFORTUNE
(*Gazette*, 22 August 1981, from McArthur 1989:8)

The comic book series *Angloman* (Shainblum & Morrissette 1995, 1996) has characters such as *Poutinette*, *Capitaine Souche*, and *Blocman*; the borrowings are intended as humorous parodies of the political divisions in the province.

Pure laine and its English translation have given rise to a series of innovative creations in politically-loaded discourse: thus we find references to *pure polyester*, the *Impure Wool Society*,[2] and *Presque Pure Laine*.[3]

6. Motivation. Three types of factors play a role in motivating borrowings in the corpus: linguistic, social, and rhetorical/attitudinal.

6.1 Linguistic Factors: Borrowing as Motivated by Lexical Need. Lexical need and lexical efficiency have been suggested as motivations for some borrowing (Weinreich 1953), but obviously not all borrowings are so motivated. Terms which fill gaps in the host language lexicon by naming new objects or concepts can be distinguished from those naming objects or concepts for which the recipient language already has words; Myers-Scotton (1997:5) distinguishes these two types of borrowing by the terms *cultural borrowed lexemes* and *core borrowed lexemes*. *Poutine* and DEC are thus cultural borrowings, as are many of the French-only institutional and political designations. Similarly, *dépanneur* and *autoroute* would appear to be straightforward core borrowings. Yet the distinction between cultural and core forms is not easily applied to many borrowings in our corpus. Existing host-language terms are often not purely redundant: for example, the terms *Quebecer* and *Québécois*, both designating residents of Quebec, have different referential, stylistic and associative meanings. The notions of lexical need and efficiency seem unable to account for the highly complex nature of meaning.

6.2 Social Factors: Borrowing as a Profile of the Nature and sites of contact between two language communities. It has long been accepted that languages in general borrow from a language of higher socio-economic and political prestige. 'The greater influence of one language over another can be accounted for by presuming a 'prestige differential' (Haugen 1969) that reflects the status of one language group vis-à-vis another' (Palmer & Harris 1990:77). Moreover, the borrowings themselves can be indicative of social and power relations between the communities in which they occur. In a study of borrowings from Arabic in the Algerian French press, Morsly states,

> L'emprunt, en situant quels objets, quelles valeurs sont adoptés ou non deviendrait un indicateur des zones d'interculturalité et des zones de résistance. (1995:45)

Centuries of borrowings between French and English in Europe reflect the contacts and relationships of prestige, influence and political dominance between the two countries (see Dubois 1992 for examples). In describing the influence of international French on British English, Chadelet states that the most frequent current semantic fields for French-English borrowings are cooking, fashion, entertainment, and social structures and relations (1995:56).

An analysis of borrowings in Quebec English reveals the role French has played in establishing vocabulary in the fields of language and politics in Quebec and Canada. Fee observes:

> The set of words that has been integrated most thoroughly into Quebec English and even beyond into Canadian and world English is the set of words that deals with Quebec politics, especially linguistic politics. Because much of the debate over these issues has been carried out in the national media and by some of the most important public figures in the country, the words used are quickly disseminated and integrated into the domain of Canadian political discourse. (1991:17)

However, it would be a mistake to draw conclusions about Quebec English as a whole based on the analysis of one domain of discourse. Journalistic writing concentrates heavily on political and language issues. An analysis of borrowings based on a journalistic corpus alone would produce a skewed picture of the Quebec English lexical landscape.

6.3 RHETORICAL AND ATTITUDINAL FACTORS. The use of borrowings in our corpus reflects the strong influence of French on the Quebec English lexicon. The extent to which this translates into acceptance of French borrowings by the individual, however, cannot be discovered by analysis of this corpus. Crystal writes of Quebec English: 'In an area where language attitudes are strong… the extent to which Anglophone people are prepared to use words which are perceived to be French in origin varies greatly' (1995:343).

However, our findings do indicate that rhetorical factors play a role in borrowings, particularly in certain contexts and genres. Like intralingual switches of register, style, or dialect, the switch of language can be a marked choice. The use of nonce borrowings can create exotic appeal. In headlines, innovative uses of borrowings create interest and attract attention. In some examples, borrowed terms, specifically highly charged terms, are used ironically or derisively; this usage was confined largely to the field of politics, where discourse tends to be emotive and reflect high degrees of tension.

7. CONCLUSIONS. This analysis of a written corpus of Quebec English has revealed a liberally francized lexicon. Lexical borrowings have been observed in all sections of the corpus; the semantic fields of the borrowings and the ways in which they are used varies with the domain and the rhetorical purpose of the discourse. French has had a marked influence on the lexicon of the discourse of language politics in Quebec. Moreover, the state's prescription of French institutional nomenclature has left a clear mark on Quebec English administrative discourse.

New considerations in the analysis of borrowing behavior have been brought to light. Specifically, certain uses of borrowings seem to reflect rhetorical purpose, particularly in genres such as touristic promotional material, headlines, and editorial writing.

In the corpus under study, we have observed that social factors, domains of discourse and rhetorical choices are reflected in the borrowing patterns evidenced. Thus social and rhetorical as well as linguistic factors appear to influence what terms are borrowed and in what discursive contexts borrowings occur.

This paper has reported on findings to date in a research project still in progress. By working with an expanded corpus and with texts from other domains and representative of a wider variety of genres, we hope in future years to gain more insight into the universal phenomenon of linguistic borrowing, the dynamics of written discourse in a contact situation, and specifically, the influence of French on English within the Quebec context.

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[1] The author gratefully acknowledges financial support for this research in the form of grants from FCAR (*Fonds pour la Formation de Chercheurs et l'Aide à la Recherche*) and the *Fondation de l'Université de Sherbrooke*. Thanks also to research assistants Elspeth Tullock, Marielle Mencé, Lucie Dubois and Nancy Wright, and to Katherine Barber and Céline Beaudet for consultation.

[2] A term created by the provocative Mordecai Richler for the offering of the Prix Parizeau, an annual literary prize for the best work of fiction by a Quebec non francophone.

[3] A store created by anglo-rights activist Howard Galganov to challenge Quebec's sign laws.

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APPLYING LINGUISTICS: AN ANALYSIS OF GRAMMATICAL EXPLANATIONS GIVEN BY TESL UNDERGRADUATES

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The teaching of grammar has come back into vogue in many first and second language classrooms. This return of the pendulum offers theoretical and applied linguists an excellent opportunity to reform and modernise the way in which grammar is introduced and explained at the primary and secondary levels. However, in order to bring about any significant change in the teaching of grammar, linguists need to become aware of how their university students understand the grammar they are taught and how they apply this knowledge in teaching situations. Unfortunately, relatively little research has been done in this field. Leech (1994) and Bloor (1986) have looked at the grammatical knowledge of second language students in general, but neither author has focussed on the metalinguistic awareness of students preparing to teach in particular. Carter (1990, 1995), like many of those involved in the Language Awareness movement in Europe, has considered pedagogical implications of grammar teaching, but has not looked at how the grammatical knowledge of the teacher impacts on classroom performance.

The only author who comes close to the mark targeted in this paper is Andrews (1997), who has conducted several studies into the grammatical explanations given by both native-speaking and non-native-speaking in-service teachers of English as a Second Language (ESL) in Hong Kong. Yet, even this author's field of interest is somewhat removed from the focus of the current study since he has not yet considered how grammatical instruction in the teacher training classroom impacts on prospective teachers' understanding of the workings of English and on the pedagogical decisions they eventually make in their own classrooms. In short, no one has yet taken a close look at both the implicit (linguistic) and explicit (metalinguistic) grammatical knowledge of those who are called upon to apply linguistics to classroom situations.

The research presented here is an attempt to remedy this situation. The findings that are reported constitute the results of the first part of a multi-phase study of the relationship between the implicit and explicit grammatical knowledge of ESL teachers and of the impact of both sorts of knowledge on pedagogical decision-making. This particular paper looks at the performance of Teaching English as a Second Language (TESL) students on a grammatical explanation task. Its purpose is to identify those characteristics of ESL teachers-in-training that correlate significantly with an ability to provide accurate, coherent grammatical explanations. It is also intended to provide some insight into where and how teaching students' grammatical explanations break down by examining the items that posed particular problems to the participants.

1. THE STUDY

1.1 SUBJECTS. A total of 101 TESL undergraduates in a Canadian university participated in the study, 93 of whom turned in questionnaires that were ultimately usable. Of the usable questionnaires, 19 were completed by men and 74 by women. These figures reflect the gender imbalance in the TESL programme under study. The participants ranged in age from 19 to 54. All of them had native or native-like ability in oral English and all were bilingual or multilingual. Even though the participants were enrolled in an undergraduate programme, 54 of them (58% of the group) had at least one previous undergraduate degree. Some held more than one undergraduate degree and several had masters degrees. In short, the students under study represented a rather elite group of 'undergraduates'.

Approximately two-thirds of the participants were in their third and final year of the programme. The others were in their second year of study. All of the participants had completed the first in a series of two obligatory grammar courses and most had completed both of the courses. In addition, a few individuals had done an optional pedagogical grammar course. The approach used in the obligatory sequence of classes was inspired by Quirk and Greenbaum (1986) and by Quirk, Greenbaum, Leech and Svartvig (1985). Students attended lectures and did exercises, some of which involved elementary parsing of sentences. The terminology adopted in class was a modified version of that espoused by Quirk et al. (1985). A number of comments made by participants in the study made it clear that they had not been called upon to give grammatical explanations in their grammar courses. However, the consensus seemed to be that the explanation task was a welcome addition, even when students found it difficult to do.

1.2 THE QUESTIONNAIRE. The participants were asked to complete a two-part questionnaire. The first part was designed to collect personal data, including sex, age, educational background, linguistic background and teaching experience. The second was an error correction task. The participants were given eight items, each containing a single fundamental error in English grammar typical of those errors commonly made by native speakers of French. They were then asked to rewrite each sentence correctly and then to explain in writing why the original sentence was wrong. There was no time limit imposed on the task. It took most of the participants 30 to 40 minutes to complete both parts.

	Version A		**Version B**
1	He will to go to Montreal and he will to visit the Botanical Garden.	8	I can to play soccer and I can to play football.
2	I like the book who is on sale.	7	Mary wants the book who is on the table.
3	Yesterday, I did play hockey and I did go sliding and I did watch television.	6	Last night I did watch television and I did play with my friend.
4	I like the school. I think the education is important.	5	My mother goes to the church every Sunday. The religion is important to her.
5	My friend breaked it, not me.	4	I runned all the way to school.
6	She couldn't finished in time.	3	He couldn't played hockey.
7	I eat toast for breakfast every days.	2	I like every stories.
8	Yesterday, I have played hockey.	1	He has finished two hours ago.

Table 1. Assessment items.

There were two different versions of the test, each including the same types of items worded differently. A total of 34 participants did the A version and 59 the B version. The distribution of the two versions was not random. It was done so as to prevent students from passing on information about the test to friends in another group. As an additional precaution, the item types were presented in reverse order on each version test to allow the researcher to check for a tailing-off effect on the final items. The items of both versions are shown in Table 1.

1.3 Scoring. All of the tests were scored by the researcher and a second person, each working independently of the other. A six-point flow-chart was used in the scoring process. This approach requires a series of yes or no decisions. Initially, scorers have to decide whether an explanation is essentially good or essentially bad, and then follow up with a number of finer decisions depending on the direction taken as a consequence of the first decision. Ideal answers were provided to serve as models for the scorers, and the grammatical terminology the students had been exposed to in their grammar courses was taken into account. The system for awarding points can be broken down as follows:

0 - no explanation
1 - an explanation or attempt at an explanation which is completely wrong
2 - an explanation which is essentially wrong but contains some true element or a couple of words which were essentially correct but which in no way constituted an explanation

3 - an explanation which was essentially correct but which had either little development or an incorrect element
4 - an accurate explanation with some, but not complete development
5 - an accurate explanation with complete development (very close to the ideal answer)

Once scoring was complete, the results of the two scorers were correlated using a Pearson Product Moment Correlation. Inter-rater reliability was found to be .90, a highly satisfactory result given the complexity of the marking task.

2. Results. The first step in analysis was to determine if there were any significant differences in the ways the students performed on the two versions of the questionnaire. Although there were a few minor discrepancies, none reached statistical significance and all could be accounted for on a post hoc basis when the make-up of the A and B groups was taken into account. Although the comparison of results on the two versions revealed a certain tailing-off effect (cf. Item 8 on Version B and Item 1 on Version A), the effect did not reach statistically significant proportions.

Once it had been determined that the students' performance on each of the versions was approximately the same, the average score per item was calculated for the entire group. The results are compiled in Table 3.

The low average item scores reveal that subjects, as a group, had a good deal of trouble with the grammatical explanation task, averaging only 21.41 out of a possible 40 points. The average per item score of 2.68 falls below the cut-off score of 3 awarded to generally acceptable answers. These poor results parallel those reported by Andrews (1997), but many of Andrews' subjects had no formal grammatical instruction, while the students reported on here had had at least one and usually two previous grammar courses.

An item by item analysis reveals that scores were weakest on the items which targeted the verb phrase and which required the subjects to distinguish between finite and non-finite forms. This tendency ran counter to what had been predicted on the basis of the performance of several of my TESL Centre colleagues on the

Version	1	2	3	4	5	6	7	8	Total
A, n = 34	1.96	3.53	2.06	2.87	3.41	2.79	2.72	2.78	22.12
B, n = 59	2.27	3.43	2.28	2.27	3.70	2.24	2.37	2.43	21.00

Table 2. Average item scores by version (Version B order).

Item	1	2	3	4	5	6	7	8	Total
Score	2.16	3.47	2.20	2.49	3.60	2.44	2.50	2.56	21.41

Table 3. Average item scores of group as a whole (Version B order).

questionnaire. They had found the quantifier problem to be the hardest to explain, followed by the item involving the article. Table 4 lists the items from most to least difficult according to the performance of the group as a whole.

The difficulty level of Item 1 might have inflated by the tailing off effect which can be observed on the A version of the test. Although this effect does not reach statistically significant levels, it might have been sufficiently strong to push this item into first place on the difficulty scale. However, when the same item was offered as the initial item on the B, the performance of the group was very weak.

The next step involved dividing the total sample into thirds and comparing the averages score for each third on a per item basis. This was done in order to gain an understanding of what subjects offering sound explanations knew that subjects offering flawed explanations did not. The results are reported in Table 5.

Items 6, 1, 4, 3 and 8 had the greatest discriminating power. Significantly, four of the five are verb phrase items. This once again focuses attention on the difficulty many students had in explaining the workings of the verb phrase. These numbers also show that an ability to sort out finite and non-finite forms correlates highly with a general ability to provide sound written explanations of basic grammar

Item	Version A	Version B
1	He will to go to Montreal and he will to visit the Botanical Garden.	I can to play soccer and I can to play football.
3	Yesterday, I did play hockey and I did go sliding and I did watch television.	Last night I did watch television and I did play with my friend.
6	She couldn't finished in time.	He couldn't played hockey.
4	I like the school. I think the education is important.	My mother goes to the church every Sunday. The religion is important to her.
7	I eat toast for breakfast every days.	I like every stories.
8	Yesterday, I have played hockey.	He has finished two hours ago.
2	I like the book who is on sale.	Mary wants the book who is on the table.
5	My friend breaked it, not me.	I runned all the way to school.

Table 4. Item difficulty for whole group (listed from most difficult to least difficult).

Sub-group	1	2	3	4	5	6	7	8	Total
Bottom third	1.15	2.97	1.39	1.39	3.00	1.02	1.97	1.84	14.71
Middle third	2.03	3.63	2.00	2.55	3.97	2.23	2.56	2.45	21.42
Top third	3.29	3.81	3.21	3.53	3.82	4.08	2.97	3.39	28.10

Table 5. Results of divided sample analysis (n=31 for each group).

points. Those who explained the verb phrase items well were almost all in the top third in terms of their overall score.

The most striking difference between the performance of the upper third and that of the lower third is found in Item 6. Here the average score of the upper third was exactly quadruple that of the lower third, a rather staggering difference. More worrisome is the fact that the average score for the bottom third on Item 6 is very close to 1. Since a single point was awarded for answers which were totally off-base, the conclusion to be drawn is that few of the students in the bottom third had even the slightest idea of how to explain what was wrong in 6, even though the item does not appear to be a particularly difficult one to explain.

Given the mystery surrounding the appalling performance of the lower third on Item 6, a closer examination of the erroneous explanations offered is in order. A few of the more revealing explanations offered in response to the A and B versions of the item are given below:

ITEM A3: SHE COULDN'T FINISHED IN TIME.
- Finished means she has finished in time—but she did not finish.
- If sentence is in present, person has confused past and present forms of the verb. If sentence is in past, wrong modal and form of verb used.
- Finish, not the past tense "finished". It is the imperative form, like French "elle ne pouvait pas finir en temps".

ITEM B6: HE COULDN'T PLAYED HOCKEY
- Present not past tense especially before (sic) a modal auxiliary.
- played: past tense of verb "play" though the sentence isn't in the past so we should keep the verb 'play' the same way (in the present).
- Verb should be conjugated in the present, no marker to use past time.

These explanations, typical of those offered by the bottom third, provide the researcher with several important insights. The first two explanations offered in response to Item A3 show that the participants cannot clearly identify the problem at hand. One can only speculate about how ESL students would respond to such 'explanations'. The other offerings for Items A3 and B6 show the prevalence of the idea that the bare verb following the modal auxiliary is the simple present form (i.e. a conjugated verb). Since the students participating in this study had been previously called upon to parse sentences in their grammar courses, their inability to distinguish between finite and non-finite verb forms came as quite a surprise. Indeed, they seem to have little grasp of how the verb phrase is put together, even after analysing quite a number of verb phrases in class and doing a series of related homework assignments.

The 'wildness' of many of the answers in the bottom third prompted a comparison of the percentage of wild answers for each third, first for all of the items combined and then on an item by item basis. The results are given in Tables 6 and 7.

These figures show that the top third of the group was not given to offering explanations which were totally off-base. In contrast, those respondents in the bottom third produced wild explanations over 50% of the time on average, over 70% of the time on Item 8 and over 80% of the time on Item 6. The bottom third even offered up wild explanations when the task was fairly easy. Items 2 and 5 presented little in the way of an intellectual challenge and proved to be the easiest for the group as a whole, yet the students in the bottom third were not even close to the mark 45% of the time for Item 2 and 52% of the time for Item 5.

The next step of the study consisted in looking for factors which might correlate positively with strong or weak performances on the explanation task. If such factors could be identified, it might be possible to take some sort of remedial action and improve the performances of those students who seemed to be guessing wildly in their explanations. To this end, profiles were sketched out for each of the thirds. The criteria considered appear in Table 8.

In terms of the first and second criteria, a quick glance shows that there are no significant differences between the subjects in the three groupings. The gender balance is quite consistent across the thirds, as is the balance of anglophones, francophones and speakers of other languages. Furthermore, as Table 9 illustrates, there is no statistically significant difference between the performance of the men and that of the women, either on an item by item basis or in terms of total scores. As for the percentage of students with previous degrees, the differences initially appear to correlate with performance, but, in the end, this did not prove to be the case. One blow against the influence of degrees is dealt by the evidence in Table 10, where it can be seen that those with two or more previous degrees were wilder in their answers than those with a single degree and almost as wild as those with no degree.

Group	**% Wild Answers**
Bottom third	53
Middle third	30
Top third	9

Table 6. Average of percent wild answers given.

Sub-group	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Bottom third	39	45	58	23	52	81	16	74
Middle third	23	23	35	3	16	65	3	55
Top third	6	3	13	0	3	23	3	16

Table 7. Percentage of wild answers per item (divided sample).

Criterion	Bottom Third	Middle Third	Top Third
Sex	6 men 25 women	7 men 24 women	6 men 25 women
Mother tongue	20 English 3 French 2 Greek 2 Italian 1 German 1 Spanish 1 Armenian 1 Portuguese	20 English 5 French 1 Greek 2 Italian 1 Arabic 1 Ukrainian 1 Urdu	18 English 5 French 1 Greek 4 Italian 1 Arabic 1 Vietnamese 1 Hungarian
Percentage with previous degree	45	58	71

Table 8. Sub-group profiles.

Sex	1	2	3	4	5	6	7	8	Total
Men	2.48	3.62	2.47	2.85	3.84	2.88	2.66	2.83	23.65
Women	2.13	3.46	2.16	2.51	3.68	2.42	2.47	2.45	21.26

Table 9. Analysis by sex

Number of Degrees	Score	% Wild Answers
0 (n = 40)	19.83	.34
1 (n = 42)	22.21	.27
2+ (n = 11)	23.80	.31

Table 10. Analysis by degree.

An analysis of the correlation of language teaching experience with the quality of grammatical explanations found no statistically significant relationships, even when only those participants with three or more years of experience were compared to the rest of the group. Although those with over three years in a second language teaching classroom outperformed those with less experience, they did not do so in a significant manner. The results of the analysis are reported in Table 11.

The sole criterion which did correlate significantly with the performance of the subjects under study was age. The youngest age bracket, composed of those 19 to 22, was discovered to be underperforming all of the others in a statistically significant way. The results of the analysis are reported in Table 12.

Experience	N	% Wild Answers	Score
< 1 year	56	.31	20.90
> 1 year	37	.30	22.16
< 3 years	75	.32	20.86
> 3 years	18	.24	23.50

Table 11. Analysis by second language teaching experience.

Sub-group	1	2	3	4	5	6	7	8	Total
19–22	1.35	3.35	1.50	1.80	3.03	1.40	2.40	2.23	17.05
23–25	2.00	3.61	2.54	2.76	3.87	2.52	2.37	2.44	22.11
26–29	2.57	3.29	2.40	2.98	3.52	2.81	2.60	2.62	22.79
30+	2.62	3.56	2.22	2.34	3.82	2.88	2.63	2.9	22.98

Statistical Significance

19-22	Vs	23-25	.015
19-22	Vs	26-29	.008
19-22	Vs	30+	.004

Table 12. Scores by age bracket.

Sub-group	n	Sex	% with degrees	% wild answers	Average score
19-22	20	Men: 3 (15%) Women: 17 (85%)	5	46	17.05
23-25	27	Men: 4 (15%) Women: 23 (85%)	67	24	22.11
26-29	21	Men: 6 (29%) Women: 15 (61%)	95	24	22.79
30+	25	Men: 6 (24%) Women: 19 (76%)	52	30	22.98

Table 13. Age profile

When a profile of each age group is established (see Table 13), a few additional points of interest emerge. The younger subjects have not only significantly lower scores, but a significantly higher percentage of wild answers than any other group. Given their age and their place in the programme, they cannot be expected to be holders of a first degree and this criterion cannot be taken into consideration in their case. However, the degree statistics of the other groups are valid and worthy of attention. The fact that the 30+ age group, in which 52% of the members have a first degree, outscores the 26 to 29 age group, in which 95% of the members have a first degree, means that having a degree cannot be considered significant criterion in the determination of level of performance on the test items. In the end, age is the only criterion which was found to relate to performance in any statistically significant manner.

3. DISCUSSION AND CONCLUSIONS. The findings of this study were a cause of a certain amount of consternation and disappointment. The difficulty the subjects had in performing the required task was unexpected, particularly given the academic background and teaching experience of many of the TESL students under study. All of the students involved had successfully completed at least one grammar course and some had passed three courses, including one entitled Pedagogical Grammar. Many of the subjects had a number of years of second language teaching experience. Some had worked at the junior college level. A number of participants had advanced degrees in fields such as linguistics, English and modern languages.

Some of the problems experienced by the participants may be attributable to the fact that they had never been called upon to perform a grammatical explanation task in the course of their studies, a fact commented upon by a number of the subjects. Perhaps teacher trainers covering the grammatical component of a course of study would be well advised to work a variety of written and oral explanation tasks into their teaching repertoire. Preliminary findings from a second study would suggest that this is indeed the case. This possibility will be further explored in a new research project designed to measure the impact of integrating explanation tasks into teacher training procedures.

The integration of explanation tasks might also serve to reduce the number wild grammatical explanations being offered by student teachers. If students are called upon to justify and explain their view of English grammar, they might be more inclined to check the validity and coherence of their explanations before presenting them in the classroom. This might in turn give rise to greater teacher accountability in ESL.

The most difficult finding to come to terms with is the statistical significance of age. Since age is not something over which professors have any control in their classrooms, this finding provides the teacher trainer with more frustration than information. Before any conclusions can be drawn about what is to be done in training younger students, further information must be gathered concerning the population in question. Many of the 19 to 22 year olds involved in this study are the product of a rather unique set of social, cultural and political circumstances. They were born in the province of Quebec (Canada) and are part of the first generation of non-native speakers of French obliged by law to attend French-language schools as a result of an aggressive language policy initiated in 1973. They are also the first generation of Quebec students to be taught a second language within a communicative framework. As such, they have probably had less exposure to explicit grammar instruction than their older classmates.

Perhaps the age difference found in this piece of research was merely the product of a particular set of circumstances. Perhaps it is a new reality with which teacher trainers will have to come to terms in a variety of different contexts. Conducting future studies of a similar design is the only means of determining what course to take in TESL teacher training.

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